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Stimulating Salesmen

Success in So Doing Depends on Just Treatment and Real Promise of Future Reward, Constantly Keeping Them Informed of Relative Attainments and by Appealing to Man's Natural Desire to Stand Out Among His Fellows

By J. E. BULLARD

The real object of stimulating salesmen is to sell more appliances or gas. While I was outlining this article I searched for a suitable title. The word stimulate suggested itself. In an effort to discover some word which might better express what I had in mind I looked it up in a book of "Practical Synonyms." This is what I found. "Stimulate, incite, urge, animate, encourage, impel, instigate, spur, goad, prompt, rouse, inflame, fire, whet, kindle, irritate, exasperate, incense." In the course of a rather long selling career, I have seen all these different things done, by companies and sales managers, in an effort to increase the selling efficiencies of sales departments. Since stimulate apparently connotes so many different and diverse acts—acts all the way from encourage to fire, from animate to exasperate, from impel to irritate—it seemed to be the exact word I was looking for.

Before any satisfactory results can be hoped for in effecting this stimulus, it is necessary for the company to get squarely behind the sales department. It is neither fair nor right for the company to expect the sales department to get squarely behind it and push it along. Any sales department has enough burdens to carry and enough troubles of its own without having them added to by any artificial obstacles placed in its way by the company.

Let me illustrate.

I know of a public utility company that sells all its appliances at high prices. In fact, these appliances are sold at such high prices that they yield the company an actual profit. This company, however, is lined up squarely behind its salesmen. Any reasonable thing they need done in order to land an order is done for them. The advertising department is part of the sales department and all the salesmen know just what is being done in the line of advertising and publicity. Each salesman is liberally paid and is in line for promotion. He can look forward to the time when he will be placed in charge of a sales department or of a small company. These salesmen are happy, optimistic and hard working. They advise their friends to come with the company whenever there is an opportunity to do so. This company is very successful in securing gratifying results from its sales force.

A Case in Contrast

I know of another company where every salesman is paid on a commission basis. If during any one month he makes a great deal more money than the average pay, he is at once placed under suspicion. Not only are these salesmen paid nothing but commission, but every employee of the company regardless of his position or salary is allowed to take orders and is entitled to the same commission on sales as is paid to the salesmen. The salesmen are given very little assistance in securing business. They never receive any new leads or "tips" in regard to prospective business until the company has tried every other means of securing the order. Wherever it is possible to keep sales in the office and away from the salesmen it is done. All orders are very rigidly verified. This causes the cancellation of many very good orders.

Yet the salesmen, insofar as it is possible to do so and retain any men on the force, are held responsible for the quality of the business accepted by the company. No promotions are ever made from the sales department. In fact salesmen are not considered as regular employees of the company, and are barred from some of the advantages enjoyed by other employees.

Little or no advertising is done by this company, and what little the company does do the salesmen never learn about except by searching through all the advertising mediums that might be used. If this lack of knowledge of the publicity work is brought to the attention of one of the executives he is likely to reply: "The canvassers should take more interest in the business and keep themselves better posted."

This company finds it necessary to sell everything at low prices and to pay comparatively high commissions. It also experiences great difficulty in finding good men

who will work for it. For the selling services it receives, it pays a great deal higher price than the first company mentioned.

It is scarcely necessary to comment on either of these two plans or to point out which is the better. The point I wish to make is that there is little hope of accomplishing very great results until the sales department of a company is so organized that the salesmen feel they will get an absolutely square deal. There is probably no class of men who are more likely to demand and are more certain to appreciate absolute justice than are salesmen. The wise sales manager will see to it that his salesmen are used justly and honestly and that future rewards on this earth, and with his company, are provided for hard, conscientious work before he will use urging, goading, exasperating or firing as a means of increasing the volume of sales.

No Excuse for Selling Appliances at a Loss

Salesmen, like all other employees, are human beings. They should be treated as such. The main difference between their jobs and the jobs of other employees lies in the greater discouragements that they are daily forced to overcome. It is neither fair nor right for any company to deliberately add to these discouragements. Just so sure as it does, it and its stockholders will ultimately have to pay the price in the ill will that is bound to grow from seed planted in this way.

The first necessity, then, is to make the conditions of employment such that the salesmen will be happy, contented, optimistic and full of hope. After this condition has been brought about the problem of securing a greater amount of business with a given sized sales force and at a given expense is greatly simplified.

I might mention here, that there is no good excuse for any sales department selling gas appliances to be conducted at a loss. All appliances can be sold at a profit as easily as, if not more easily than, at a loss. The company, however, must not make the mistake of thinking that it can take all the difference between an actual profit and a real loss and pocket it itself.

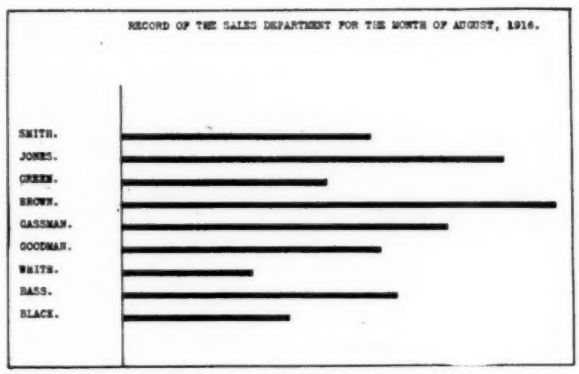
It requires better salesmanship to sell appliances at a profit than it does to sell them at a loss. High grade salesmanship also requires a higher reward than low grade salesmanship. If prices are advanced to such an extent as to show an actual profit the salesman must be paid more to sell these appliances. In some cases this increase will have to be an increased percentage of the selling price as well as an increase in dollars and cents per appliance. The more liberal salaries and commissions, however, will result in not only selling as many appliances as formerly, but will result in having them so well sold that there are fewer complaints and a greater gas consumption through the appliances.

Better paid and better salesmen must be employed. These better paid, better salesmen will naturally be more prosperous than the former poorly paid salesmen, and, as a result, will be more happy, contented, optimistic and full of hope.

It is not intended to imply that it will be necessary or even advisable to discharge all the present salesmen and hire new ones. Such a course would be the height of folly. What it is desired to bring home is the point that the more liberal the payments to salesmen are made, the greater the company can profit because in this way it can secure the services of high grade men and place its selling departments on a profit-making rather than an expense-making basis.

Simple Means Doubles Productivity of Force

Now that we have our sales department thoroughly reorganized and composed of happy, contented, optimistic, hopeful salesmen, let us see what we can do to stimulate greater sales. The first and most essential thing seems to be to keep the men informed in regard to their relative standing. I have found sales forces that practically doubled their productivity after the simple experiment of posting each man's record on a bulletin board was tried. In some cases this might not seem expedient. Usually, however, it will work wonders. It instills into the force something of the spirit of the game and inspires the men to put forth greater efforts. It is usually much better to post these records graphically than it is to post them as tables of figures. The graphical method has the advantage that it adds just enough mystery to make the records really interesting. I have seen salesmen take great pains to explain to new men or to their friends the full significance of a graphical record. They would not be likely to do this if a column of figures rather than a graph had been used. Neither would they have been able to tell at a glance just where each man stood in relation to any of the other men.



GRAPHIC CHART OF TOTAL SALES

I find a graphical chart like that in the accompanying illustration is more practical as a general rule than any other system. It has the advantage over curves in that more information and more records can be shown in a given space. It is also more easily read and understood by the average man. In the chart only one line is shown for each man. This line represents the total sales for the month. In practice it is well to show more than the total sales. For instance a black line may be used to show the total sales. Below this there may be a green line showing the percentage of collections made on sales. Below this there might be a red line indicating the number of orders cancelled.

In nearly every sales department it is better to post up two or three phases of a man's record. These should be the two or three that the company considers the most important. It sometimes happens that the man who makes the most sales is not so valuable as some other man in the department. These records must be so constructed as to show the real value of each man.

Another method of posting records that usually proves very effective is the use of the terms used in baseball. For instance, a daily quota may be determined and the records of each salesman kept in percentages of this quota. This record should be revised and brought up to date daily. A sample record is given here. The

STANDING OF SALESMEN
JUNE 1ST TO JUNE 19TH, 1915

	Batting Average.	*Fielding Average.*	*Errors Average.*
Smith	.592	.927	.000
Jones	.569	.648	.000
Green	.500	.515	.000
Brown	.386	.412	.066
Gassman	.364	.515	.000
Goodman	.227	.397	.000
White	.182	.265	.083
Bass	.180	.675	.001
Black	.179	.750	.025

batting average represents one phase of the man's selling record, the fielding average another and the error average a third. These averages as has been stated are figured on the basis of the predetermined quota. What each kind of average represents is decided upon in the same way that it is decided upon what shall be represented by each color on a graphic chart.

In a town or city where there is much interest in horse racing, the records during the racing season can be kept on the picture of a race track. Each man can be represented by a numbered picture of a horse and a rider. These pictures can be fastened to the heads of pins and moved from day to day to show the standing of the men. Of course with this system only one phase of a man's work, such, for instance, as his total sales can be shown.

In the Fall the sales department can be divided into two competing teams and their records kept on the chart of a football gridiron. In the same general way all the sports and their terminology can be pressed into service by the active, wide-awake sales manager. When he does it skilfully he makes the sales work more human, interesting and joyful.

RESULT OF PRIZE CONTESTS DEPEND ON MANNER IN WHICH THEY ARE CONDUCTED

Many companies have found prize contests among the salesmen very productive. The results secured from such contests depend to a very great extent upon the way they are conducted. It is not the prize or the money that is represented by the prizes that makes these contests effective. It, rather, is the excitement and enthusiasm that can be engendered into them. A contest that ends with a banquet at which all the officials of the company are present and which is given a great deal of publicity throughout the organization will prove far more effective in securing results, even though the prizes awarded are only cheap medals, than will a contest where several hundred dollars in cash is distributed in a very quiet and unobtrusive way, and the salesmen are not kept keyed up and carefully informed of their relative standing throughout the contest.

It must always be borne in mind that the college boy will try just as hard, and, in most cases, considerably harder to win for his college, though he receives no financial reward, than does the professional athlete, who is making a very good living as the results of his efforts to try to win his contests. The college boy is working for glory and honor. The professional is working for money.

In all contests this fact in regard to human nature should be taken advantage of. Where money is the only reward no such effort can be expected as will be put forth where glory and honor can also be introduced. Glory, if not honor, is, to a very great extent, the result of publicity. Therefore, the more publicity contests are given the more likely they are to prove profitable to both the company and the salesmen. Men do not work for money alone. The man who thinks only of money is of very little value to himself or to any one else. All men, however, have an instinctive desire for fame. Take advantage of this desire and your contests will all prove great successes.

To sum up: the successful way to stimulate salesmen depends first upon giving them an absolutely square deal with a real promise of future reward. Second, upon keeping them fully informed in regard to their relative standings. Third, upon making the occupation of selling as glorious and honorable as possible and giving ungrudgingly to each salesman ample opportunity to win as much fame as it is possible for him to win.

In Future Rochester Company's Gas will be All Coal Gas

Herman Russell Discusses Heat Unit Standard Recently Adopted in Second District, New York State—Company Anticipated Ruling and Is Now Constructing Facilities to Reduce High Proportion of Water Gas

Four years ago this company, being confronted with steadily increasing oil prices which during the coming year will amount to an increased cost of $150,000, and feeling certain that the investigations then in progress would result in the establishing of a heat unit standard for the Second District of New York State, began making plans which culminated this year in the awarding of contracts for a large coal gas plant which is now being constructed, declares Herman Russell, assistant general manager of the Rochester Railway & Light Company, in discussing the possible effect of the recent establishment of the heat unit standard by the Public Service Commission, Second District, New York State, upon the affairs of his company.

Upon the completion of the new plant, during 1917, the company will be distributing a gas composed of a mixture of about 70 percent coal gas and 30 percent carburetted water gas, whereas the gas now distributed is about 85 percent carburetted water gas and 15 percent coal gas. It is the intention to steadily increase the capacity of the new coal gas plant until practically all the gas made will be coal gas.

This change will result in a gas having excellent heating value, more uniform in quality and lower in specific gravity; therefore, easier to distribute, better adapted to household and industrial appliances, and better for illumination as used in the mantle burners.

It will, however, have less open flame candle power, and those persons depending on the open flame burner for general lighting purposes should equip their fixtures with mantle type burners. As this change will result in the saving of gas and in a much better light, it will prove to be a benefit rather than otherwise. All gas appliances are now adjusted for oil enriched water gas, and the change to coal gas will probably mean a considerable readjustment of burners.

DIFFICULTY OF OBTAINING CONSENT TO CHANGE IN STANDARD

In the earlier days of the gas industry, gas was used for illumination purposes only, and the medium employed was the open flat flame burner. Quite naturally the quality of the gas was measured in terms of the most

convenient unit—the candle—and candle power standards were established by state and municipal bodies at that time. With the advent of the Welsbach mantle burner whose illuminating qualities are dependent upon the heating power of the non-luminous Bunsen flame, with an increased illuminating efficiency of six to eight times that of the open flat flame burner, the percentage of gas used for lighting in the open flame burner has steadily decreased, until today it is a negligible quantity.

Coincident with this change in illuminating methods has come the very great increased use of gas for cooking and other household purposes, and also a rapid growth of the larger industrial uses wherein the heating quality of the gas only is of importance.

As a result of these changes scientific men have recognized that to continue to measure gas quality by the candle power standard was illogical and unfair, and they have advocated a heating power standard.

However, standards once fixed are difficult to change, and a long campaign of education has been necessary in order to overcome the inertia of established custom and to convince regulating bodies that a change in the form of standard was both logical and necessary.

In the meantime, therefore, the gas companies have gone on making their product to conform to a candle power standard, and they have adapted their process of manufacture so as to enable them to produce a gas meeting the requirements of such a standard at the lowest possible manufacturing cost, in spite of the fact that the gas was no longer put to uses where the candle power standard was a true measure of its usefulness.

Also, the methods of manufacture best suited to produce a gas of high open flame candle power are not as a rule the most economical or the best adapted to produce a gas of satisfactory heating value. This has become especially true in the last few years, with the rapid rise in the price of oil due to the great increase in the use of the automobile.

Increased Cost of Oil a Heavy Burden

In order to make the gas conform to the usual high candle power standards, all companies had to resort to methods of manufacture which required the use of large quantities of oil. At a time when this oil was cheap these processes were economical, although the heating value of the gas produced was not commensurate with the amount of oil required. The increased price of oil has shouldered a heavy burden upon the gas companies until today many companies are confronted with the possible necessity of having to raise the price to the customer. The adoption of reasonable heat unit standards at this time will in a measure relieve this situation so that companies can slowly change their processes of manufacture, to do away with those processes that require much oil enrichment. The most immediate result will undoubtedly be the substitution of coal gas for carburetted water gas.

The new order in upper New York State went into effect Jan. 1. The change in standard will have but little immediate effect upon the Rochester Company or the quality of gas distributed, because it is not possible to economically alter the present manufacturing methods until the new coal gas plant is ready for operation. This is not expected to be ready until the spring and summer of 1917.

Many states have been operating under a heat unit standard for some time, and now that New York State, Second District has adopted this standard, other states will follow the lead already established, and gas will soon be universally measured by a standard in harmony with its present day use.

Industrial Gas Progress at Roanoke

H. H. Dunn Tells What Is Being Done in Youthful City of 50,000 Population—One Candy Company Uses 94,000 Cu. Ft. of Gas in Month

Domestic fuel appliances, room-heaters, coil and automatic water heaters are in the majority of the homes of Roanoke, Va., states H. H. Dunn, of the Industrial and Illuminating Department of the Roanoke Gas Light Company, in the January *Bulletin* of the Southern Gas Association.

Every hotel in the city but one is now using gas in the kitchen. Every restaurant is now supplied with gas appliances for nearly every cooking operation.

We have steadily increased our lighting business with five, three and one mantle arcs, and the single mantle upright until we are now maintaining 1600 of the above types of lamps on a sliding maintenance scale that insures us that the consumers who have our lamps are using gas.

Candy manufacturers in Roanoke, with the exception of one concern, which we are now about to land, manufacture every pound of candy on gas candy furnaces, and the Martha Washington Candy Company used 94,000 cu. ft. last December.

Our one brewery, before the State went dry, used gas for melting pitch, pitching beer bottles and branding, and decided to make "near-beer" after prohibition went into effect and called on us to remove the alcohol from beer with gas, which we did very successfully with a No. 4 Ruud water heater, working on a vacuum pump with atmospheric air heated to the proper temperature automatically through the coils, in place of water, and reduced the alcohol to 3-4 of one per cent. But the Board of Directors has decided to make fruit juices and denatured alcohol and has expressed a desire to use this system in distilling.

There was a law passed in the state requiring that all glasses used at soda fountains should be sterilized before serving. This problem was put up to us by one of the leading druggists and we solved the problem by using the Ideal Steam Cooker, made by the Toledo Cooker Company, of Toledo, Ohio, and by making slight changes in the interior compartment, which gave an ideal system of glass sterilizing and put out nearly forty of different sizes on gas consumption. That means quite an item to us.

We are roasting chestnuts on the street, run gas to peanut and popcorn wagons and machines singeing chickens, wrapping bread, and dry proof boxes in bakeries with our own burners, heat water in baptismal tanks in churches, and have at last broken into the big industrial plants and are getting a chance at the tempering of tools, brazing, tinning.

We are now working on a 21-ft. long rod-heating furnace for rivet making in which the estimated gas consumption will run over 1,000,000 cu. feet per month, with the expectation of getting into all the plants of the Norfolk & Western shops, the Virginia Bridge & Iron Company, and the Pyrites Mfg. Company, whose estimated consumption would mean the tripling of our present yearly output.

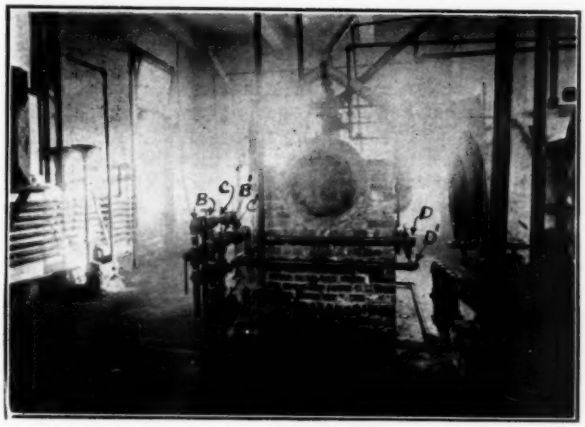


FIG. 4. ONE CONTROL FEEDS TWO BURNERS ON A SIDE

FIG. 5. GAS GOVERNOR INDICATED BY LETTER A AT LOWER RIGHT HAND CORNER OF FURNACE

Results of Tests of Gas-Burning Systems in Oil Cracking Installation Show Need of Careful Study of Industrial Fuel Tasks

Need of Delicacy of Control Determined Use of Gas in First Place—Careful Tests Indicated Advantages of One Method of Applying Such Fuel Over Others

By HENRY L. READ

Engineering Department, Surface Combustion Company, New York City

In the chemical laboratory of a well known oil company are a number of experimental stills for the cracking of heavy oils into gasolene under pressure. Owing to the requirements of the work, the greatest delicacy of control is always necessary. City gas consequently has been selected as fuel.

When a new still was installed some months ago, the company decided to run tests to determine what burners would best serve its purposes and at the same time permit of an appreciable saving in gas, although this latter point was of secondary importance.

A comparison was made between the type of burners then in use under the existing stills, a type recommended by the gas company, and the Surface Combustion burners.

An understanding of the nature of the proposition may be gained from the fact that in certain of the experiments a variation of two degrees Fahrenheit from the desired temperature would seriously injure the results, and a variation of five degrees would practically nullify the run.

As each run lasted from twenty-four to thirty hours and involved several days of preparation, care was naturally taken to avoid anything that would tend to interfere with the successful conduct of an experiment.

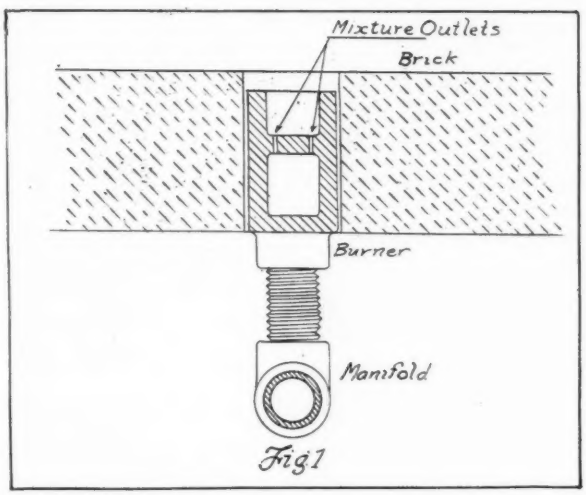
Types of Burners Considered

The oil company's burners were of the standard-drilled port pipe design to which air was supplied from a positive pressure blower and gas through a nozzle in a suction tee.

The gas company provided blast burners of a good type to which air and gas were supplied as before. A section view of one of them is shown in Fig. 1.

The constructions of the still, furnace and Surface Combustion burners and accessories are illustrated in the drawings, Figs. 2 and 3, and in the photographs, Figs. 4 and 5.

It will be observed that there are five burners on a side which are supplied with a mixture of air and gas in the correct proportions from two separate controls.



SECTION VIEW OF ONE OF BLAST BURNERS USED

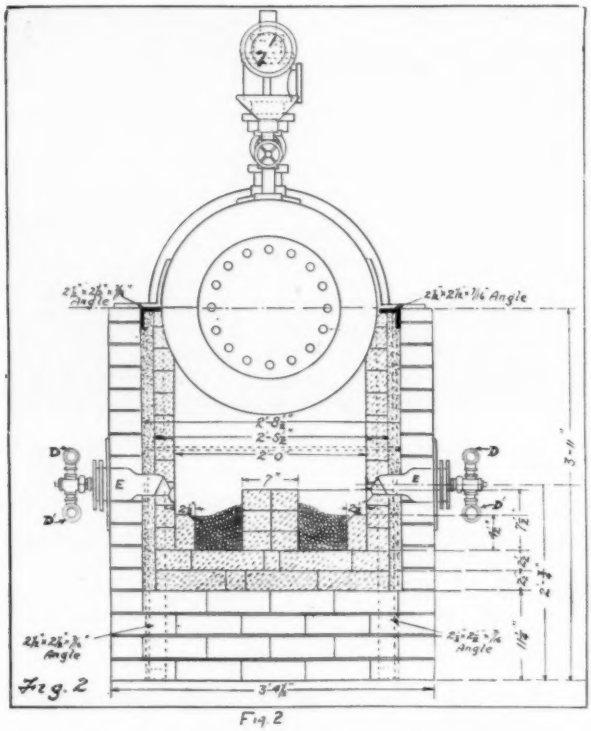


Fig 2

DETAILS OF SYSTEM ADOPTED SHOWN

One control feeds two burners on a side, and the other three. A and A' are the gas governors; B and B' the inspirator bodies; C and C' the inspirator throats; D and D' the mixture pipes; E is a burner; F a flue pipe. The oil vapors are led off through the piping on top of the welded steel drum and condensed and collected a short distance to one side.

Air enters the connections in the inspirator bodies and is directed downwards, coming from a positive pressure blower as before.

Gas enters the back of the inspirator bodies through the horizontal connections.

The three foregoing systems of burning gas were tested by the oil company's chemists with the gas company's and the Surface Combustion Company's representatives present. Two entirely successful runs were made with each system and the best one was used in figuring. On this basis the following was determined with the same temperatures and pressures, 700 deg. Fahr. and 70 lb. per sq. in., in each case:

Burners	Time of Run hrs.	min.	Gas Consumed cu. ft.	Charge lb.	Distillate lb.
Oil Co.'s	28	40	11,666	652	257.5
Gas Co.'s	26	57	7,530	653	254
Surface Combustion	23	55	7,110	654	258

Four other runs were made, two on the oil company's and two on the gas company's burners, which had to be discarded because of slight accidents.

It will be seen that the Surface Combustion apparatus showed a gas saving over the gas company's outfit of 420 cu. ft. or 5.6 per cent. But the point especially interesting to the oil company was the saving in time of three hours possible by Surface Combustion.

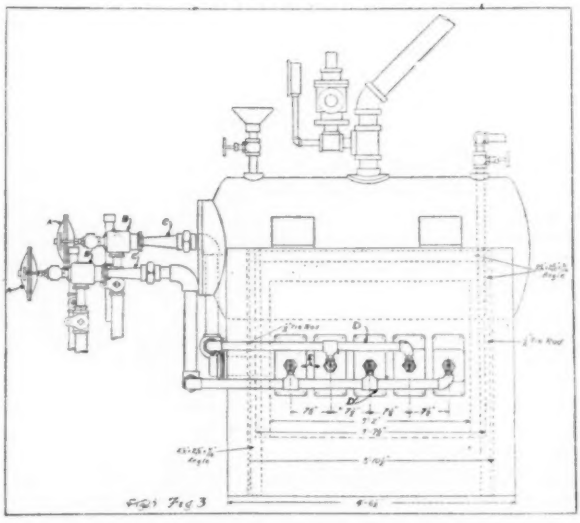
An interesting feature of the tests was the attempt by the gas company's representative to obtain a perfect mixture of air and gas as shown in the analysis of the flue products from his burners. After some effort he obtained what he desired, but found it absolutely impossible to hold it for more than a few minutes. The Surface Combustion burners, on the other hand, were promptly and easily adjusted for a correct mixture and retained their adjustment for hours at a time until the quality of the gas changed. A typical set of analyses follows:

Time	CO_2	O_2	CO
11.10	15.8	0.0	0.0
12.10	15.8	0.1	0.0
1.25	16.1	0.0	0.0
3.10	15.8	0.3	0.0
5.00	15.6	0.7	0.0

During the six hours of these flue readings, the rate of gas flow was continually varied as conditions required and no attempt made to get the same rate for each analysis. In view of this and the fact that the adjusting valve was not touched in the entire time, the performance is very commendable.

The above described process of oil cracking is, of course, an unusual one and does not include a field of any width. It shows, however, that countless opportunities for the live industrial man are at hand that have never been suspected.

In this particular case, the firing of the large commercial stills was done in part by the gas generated in breaking up the large hydrocarbon molecules. As this gas was of very uneven heat content and the control requirements in the laboratory so strict, it was no difficult matter to bring about the adoption of city gas in the latter place in spite of a considerably greater cost of fuel.



GAS ENTERS BACK OF INSPIRATOR BODIES THROUGH HORIZONTAL CONNECTIONS

It behooves the industrial experts, therefore, to devote some of their time to the possibilities of increasing their annual sales by searching out the peculiar processes in their districts needing special treatment and giving them the proper study.

Using Complaints to Win and Hold Business

George B. Cortelyou Declares "Service" Is Perhaps Biggest Word in Business of Consolidated Gas Company of New York

Practically every householder in New York City is a customer of the Consolidated Gas Company. The average account is small, amounting to a little over two dollars a month. With the hundreds of thousands of accounts which we handle there is naturally a tendency for errors to creep in; and every error that affects a customer is likely to mean a complaint, whether or not it comes to our ears, states George B. Cortelyou, president of the Consolidated Gas Company of New York, in an article in the January number of *System*. Naturally unusual pains are taken to guard against errors, and when one occurs we make a special point of settling it to the satisfaction of the customer; for if we fail to "make good" it takes a long time to live down one of our mistakes.

Service, therefore, is perhaps the biggest word in our business—we must be continually on the alert to improve and perfect it, for it is mainly through service that the good will of the public is secured and retained; and good will is one of our greatest assets. We may comply fully with all legal requirements as to price, quality, and the like, and yet fail of the highest results solely through neglect of service—or of what may be termed the human or personal element of the business as it affects its public relations.

Average Citizen's Opinion of Utility Based on His Every-Day Experience with It

The average citizen's opinion of a public utility corporation is based not upon its financial nor administrative organization, however excellent these may be, but upon his everyday experiences with its representatives. If he finds that his complaints receive prompt and courteous attention and that the company's employees take a real and intelligent interest in seeing that he is kept a pleased and satisfied customer, his impression of the corporation will be favorable; and the sum of these impressions is public opinion.

We insist, therefore, upon prompt attention to the tens of thousands of calls that we receive. The slightest complaint is immediately taken up, even though we very often find that services are rendered where the fault was not ours, but was due to leaking gas fixtures and faulty house-piping, for either of which the gas companies are not responsible.

A considerable number of complaints come to me personally, probably because my name as president appears in all of the company's advertisements. When a complaint is received, we at once write a letter of acknowledgement. In it we state that a prompt investigation has been directed, and the complainant is made to feel that he has done the company a favor—as in fact he has—by bringing the matter to my personal attention. It is then followed up promptly, usually by the call of a representative, and after the matter has been satisfactorily adjusted, a final report is made to me.

If a complaint proves to be well founded and indicates not merely a temporary lapse on the part of some employee, but a weak point in our system, we apply the necessary corrective measures. I insist upon promptness and courtesy as the two qualities absolutely indispensable in handling complaints and as governing, in general, the dealings of the company's employees with the public.

As an instance of how well employees respond to this, I may say that, in all, thirty-three consumers made complaint of incivility against some of our index men last year, but on thorough investigation by the company none of the complaints proved to be of a serious nature. Complaints about meters are comparatively rare.

Educational Campaign Keeps Customers Friendly

On this point of meter-reading we have tried to educate our customers away from complaints. We have persistently preached to housewives and others the advisibility of regularly reading their own meters to prevent waste. We furnish meter-reading cards with concise instructions. These may be obtained by applying at the office, or we mail them upon request.

Carelessness in following this advice in times gone by has led many patrons to believe that gas meters are not trustworthy, and ignorance led others to think that the meter registered gas whether it was being used or not.

When complaints are justified, however, we plan to give immediate service. During 1916 thousands of calls were made by customers who asked for our experienced "emergency" crews, which are ready to respond every hour of the day and night. We have a number of specially constructed automobiles for this emergency system. When a woman living in the neighborhood of 150th Street, say, telephones that her range acts queerly a few minutes before the hour when she starts her dinner, the emergency crew will probably have the trouble all fixed within twenty minutes after the call is received. This means something more than just having rendered that service—it may have avoided a little domestic scene if Mr. Husband might have arrived home and found "dinner not ready!" And he might have blamed the company.

The calls we receive are multiplied by the thousands in the course of the year. The telephone switchboard in our main building handled eleven thousand calls daily during the year of 1916. These calls embrace all sorts of requests, from the locking and unlocking of meters already in use to complaints that the light does not burn properly. Most persons really know very little about their gas fixtures, whether lighting or cooking; and it is usually up to the company's representatives to point out the trouble to each customer, adjust the matter promptly, courteously and educationally, and thus indirectly convince the customer that the company has no aim except to render service with its sale of gas.

Services Which the Company Performs for Customers.

In order to educate the public in the effective use of gas, we have established a model apartment. It is a purely instructive feature maintained by the gas company. A customer can step almost directly into it when

he goes uptown. The model apartment is not, of course, a salesroom. It contains a splendidly arranged kitchen, bathroom, and a series of booths, each lighted by the same amount of gas and identically the same type of fixture, to show by comparison how light and dark wall papers and hangings reflect or absorb the light rays. Instructions on cooking and ironing are given by female attendants each day between the hours of nine and four o'clock. That our customers appreciate this is evidenced by the fact that thousands of them visit the apartment, and regularly there are classes from the schools, both private and public.

A similar departure is our home demonstration system. Demonstrators call at the homes of patrons, on request, and teach them how to operate their gas ranges and other appliances properly. Last year, demonstrators visited 66,200 homes, where they gave housewives and their servants free cooking lessons and instructions in the proper use of the gas range, and how to obtain the best cooking results with a minimum use of gas.

Practically every gas consumer in the metropolis is an actual or prospective pupil in this, perhaps, the largest cooking school in the world.

Recently we went a step further, and extended this campaign to the public schools. In order to make the idea attractive to the pupils we have what we call excursions. The first was made in May, 1915, and it is typical of the others. The pupils went to the company's meter repair shops at East 111th Street.

Reversing the traditional rule of business before pleasure, a reception committee of gas company officials and employees immediately conducted the visitors to the auditorium where, together with hundreds of employees, the boys feasted on sandwiches, strawberry shortcake, coffee and other good things.

Boys Taught Details of Gas Business.

Then the boys were shown many practical facts about the everyday details of the gas business. There was a talk on the causes of flickering and insufficient lights, illustrated by an ingenious equipment of glass pipes, and a demonstration of how to get perfect flames on ordinary gas ranges and industrial burners. Then the pupils were shown how simple is the mechanism of a gas meter. Gas ranges were taken apart and afterward reassembled. This is our idea of one step in the practical education of the boys of this country, and incidentally the boys perhaps get and carry into their homes a different conception of the gas company than they might have had otherwise.

The company, of course, keeps in touch with its customers through its employees, and we recognize that our company goes up or down in the scale of genuine success just in proportion as our employees are able truly to represent us.

We are fellow-workers in a great enterprise, but an enterprise succeeds and wins the confidence of the public not because a few hold high positions or even do their work well, but because the rank and file of those connected with it are comfortable and contented, faithful and loyal to it and regardful of its duty to the public.

Employees who have grown old and physically feeble in the service of the company are given lighter tasks with shorter hours and with regular pay. All heads of departments of the various companies are men who have risen from the ranks. Special meritorious acts are always rewarded.

For instance, some time ago four of our employees assisted in the rescue of people from a burning building receiving public commendation from the press, and the company presented each man with a gold piece.

A system of group insurance has recently been put into effect by which each employee is insured for $250, to which the company adds $100 in case of death, at a cost of $2.60 a year or five cents a week. Sick benefits, including medical attention and supplies, are also provided.

Should accident or old age result in permanent disability, a pension is extended to the employee. The amount is based on length of service, and runs up to sixty per cent of the wages at the time of disability. In cases where employees die leaving families without means of support, the company is liberal in the matter of payment of rent, work is found for those able to do it, and many of our present employees are the children of former employees, now deceased.

One plan we use to decrease errors is to pay our meter readers a bonus of 25 cents for every book indexed without an error. Accuracy alone is considered —not the time taken. This bonus is not paid until a month has elapsed, so that an opportunity is given for the discovery of discrepancies. In addition, a special vacation, besides the regular one, is given to the two men in each shop who have the best records for accuracy in meter-reading for the year.

Educational Work.

Our business is of a technical nature, of course, so we have found it necessary to give special training to our men. We have instituted several schools of instruction, covering the different classes of work required. Men of mechanical experience or inclination are employed and are sent to these schools, receiving car fare and full pay while under instruction.

Each class of work is taken up separately and the student is compelled to pass a practical and rigid examination in each class of work as he progresses. When he has finally passed the school examination he is compelled to undergo another practical examination before he is accepted in any class of work by his shop superintendent. As soon as a student qualifies, his rate of pay automatically increases. He receives further increases as he shows greater effectiveness and "graduates" in the other branches of work.

An educational policy which we inaugurated some time ago for the purpose of creating a corps of competent appliance salesmen, particularly in the industrial line, has proved of great advantage to the company. By no other means could the desired result have been obtained.

A competent salesman in the industrial division must not only have mastered the art of salesmanship, but he must also have acquired an intimate knowledge of various types of industrial appliances, their construction, the various uses for which they are available, and the cost of operating them as compared with the cost of operating devices for which other fuel than gas is used. He must also be prepared to discuss these matters scientifically with experts, who are prospective customers and who have had practical experience in the use of other appliances which render similar service.

We consider that our advertising is a part of our general service policy. One rather novel feature of our advertising campaign has been our extensive use of the foreign language newspapers of New York. We vary our advertisements as seems best to suit special

conditions and racial customs and ideas. This foreign-paper advertising has proved of great value to us and has enabled the company to reach this element of our population better than we could have in any other way.

Publicity Work.

We have extended our regular publicity campaign to the issuing of a magazine called *Gas Logic*, of which we send out about fifty thousand copies every month. This magazine may be had free at any of the company's offices, or it is mailed to those who request it for twelve two-cent stamps a year—the actual cost of mailing. *Gas Logic* is a magazine in every sense of the word, containing a mass of information of all kinds. It has a page of recipes; another of instruction in the use of gas and gas appliances; another of puzzles, the solution of which is rewarded with substantial gifts in the way of gas appliances; and a questions-and-answers department, besides an editorial page. It is printed on heavy paper and artistically illustrated. It compares favorably with many magazines on the news stands, although it is really nothing more than part of our educational campaign to keep the good will of the consumer.

These are but a few of the numerous methods we use to carry out our general policy of service. There are many others. As a result of them I can say that we appear to be entering upon an era of better feeling based upon a better understanding and a realization of the fact that the welfare of the companies and the people are all bound up together.

Meetings of Employees Inefficient as Principal Means of Instructing Force as to Policies and Details of Management

Charles S. Ritter Advocates Bulletin System—Oral Instructions Not Effective—Printed Books Inadequate Because of Rules Included Becoming Obsolete

It probably is safe to assume that others besides the company I represent have experienced difficulty in presenting to their employees the policy of the management and details of their business in an effective manner, stated Charles S. Ritter, of the Detroit City Gas Company, in a paper presented at the annual meeting of the American Gas Institute. Whether there is a "one best way" or not I do not pretend to know, but the one most commonly used certainly falls very short of an ideal solution. I refer to verbal instructions and the common custom of placing a new employee in a strange place and allowing him to just drift along and pick up what he can, somewhat on the principle of "root hog or die."

The large general meetings of employees presided over by various employees and heads of departments, who indulge in the much overworked "pep talk," is also an inefficient system. Such meetings do bring employees together for a nice social time and thus foster loyalty and good feeling toward the company and each other, but it is not the time to press upon their attention important matters relating to the technique of our business. At such times the employee's attention is more likely to react on suggestions social than those of a business nature. There is also the danger that the speakers may be misunderstood. Although what they say may be expressed only as their own opinions, the fact that they are permitted by the management to address employees carries with it the appearance of having official sanction.

These meetings and smaller departmental meetings have important educational functions, however, and may be used to advantage as auxiliary to any good form of written information and instructions that may be adopted. As the principal means of carrying the policy and details of the gas business to employees they are inefficient, if not dangerous.

Printed Instruction Books Seldom Read

Printed books of instructions are inadequate because some of the rules they contain usually become obsolete before the ink with which they are printed gets dry. We could hardly afford to put out a new edition every time a change in business practice is made. A book of such rules that could stand any length of time without revision would be too limited in scope and too general in character to cover much of our business.

Another serious objection to such books is that they are almost never read. The minute details of our business cannot be forced on employees in chunks that large and when they are read it is generally in a perfunctory manner and for want of interest very little of the matter they contain is remembered.

The employees of a small company usually get most of their knowledge of the business by personal contact with the officers and its heads of departments with more or less good results, but as the company grows and employees increase, personal contact becomes less and less efficient until it almost disappears as an educating factor. The business gets more complex, new departments spring up and employees specialize more. When a department is divided the several branches progress in diverging lines and become widely separated, although their functions still bear a relationship to each other that must be maintained.

To standardize and co-ordinate the functions of departments and the duties and authority of employees so as to maintain cohesion and prevent confusion, duplication of effort and work at cross purposes is a big problem of itself. But when this is once accomplished we must still find an effective means of perpetuating the information and instructions evolved and of communicating them to all employees affected.

Psychological Time to Get Attention of Employees

The psychological time to get the attention of employees and impress them with such information is when the subject matter presented is pertinent to the conditions at hand; that is, when it is "pat." It is the only time to get a good quality of attention.

They should learn about "freeze offs" in winter when they are having experience with the trouble. That is the time the subject is given most intense consideration.

It is the logical time at which to standardize shop and office practice and define the proper attitude of the company toward the consumers affected. The instructions prepared then should become a matter of record to be preserved in such a form that the next time the same trouble occurs they may be re-used.

If we have before us a record of the methods adopted at a previous experience it will take but a short time to "bone up" on them, whereas we might have to repeat much of the experimental work formerly done to reach the same decision again.

Whatever system is used for this purpose it must be

flexible enough so that rules can be amended or cancelled on very short notice.

The bulletin system augmented by departmental meetings as used by us seems to answer the purpose very well. It was evolved from several methods and as a comprehensive system it has been a steady growth consisting of bulletins issued from time to time as the policy of the company became crystallized and the operations were standardized or revised.

If we should have an epidemic of stopped service and house pipes, the heads of departments affected would get together and work out a method for taking care of it. The complaints received, orders issued, the proper attitude to assume toward the consumers affected and other relevant matters would be considered and a bulletin of instructions to employees and departments affected would be compiled and submitted to the general manager for approval. If approved, a copy of this bulletin would be sent to the head of each department, who would receipt for it by signing the original copy. He would pass his copy around to each employee in his department to be read and signed. The original bulletin containing the receipts of heads of departments would then be returned to the office from which it was issued and the one signed by the employees to the head of the department in which they work. It would then be filed alphabetically according to subject in a loose leaf binder and held in the department for reference. It might be several years before a similar epidemic should occur and during which time we may have taken on many new employees or forgotten much of the detail of the former trouble, but when it does come again we simply refer to this bulletin and proceed accordingly.

If there has been a change in the art of handling the trouble, the bulletin would be revised and redistributed. If, when the trouble occurs, we were obliged to again go over all of the detail used in arriving at the instructions it contained or if they were not a matter of record, much valuable time would necessarily be lost in getting started right, to say nothing about the confusion and duplication of the former work in formulating a plan of attack.

Management Has Check on How Policies Are Being Carried Out

As far as the principles of the system are concerned, that is about all there is to it. There are a few things, however, that might be mentioned in connection with the distribution of the bulletins.

They should be made up on the standard letter size paper—8½ x 11 in., punched for a loose leaf ring binder in which they can be filed alphabetically by subjects. These binders should be in the hands of all heads of departments and bulletins filed in them as they are issued. It is very important that they should be easy to refer to. Much of their success depends on proper classification and accessibility. The employees' signatures on them will prevent the claim by them that they had never received the instructions given.

The bulletins may be initiated by such officers or heads of departments as are designated to do so, but they should be approved by the general manager or other executive officer in every case. The management is thus given an opportunity of knowing whether the policy of the company is being carried out correctly or not and the employees will know that the instructions given have received official sanction.

Bureau of Mines Issues Bulletin on Producer Gas Plants

Bulletin 109, giving the status of the gas producer in the United States, has just been issued by the Bureau of Mines under the title of "Operating Details of Gas Producers," by R. H. Fernald.

Mr. Fernald discusses the producer-gas-plant situation as it exists in the country to-day and also compares the producer-gas plant with the steam turbine. In this connection, the author explains:

The steam turbine naturally lent itself to central-station service. It was a unit easily understood by steam-engine operators in so far as practical operation is concerned; it could be readily erected without radical changes in the boiler-room equipment; and it rapidly met the demand for large central-station units.

The producer-gas plant was an untried factor; it met with strong opposition from the older steam-plant operators, who saw possibilities of being forced out of their positions; its installation meant a complete renovation of the entire plant, with the replacing of the steam boiler by the producer unit. Large units of this type did not materialize, with the natural result that even to-day the producer-gas power plant is not the large central-station unit, although it occupies a strong position among the isolated plants and the small central stations.

Methods of operation vary greatly with local conditions and especially with the personal inclination or opinion of the plant superintendent. This variation is, perhaps, perfectly natural, owing to the newness of producer-gas power, the absence of experienced producer-gas engineers, the absence of co-operation among the operators of these independent isolated plants, and the absence of well-defined commercial investigations.

With this lack of a common interest on the part of the owners or operators of these plants—an interest that has of late tended to place central-station operation on somewhat uniform basis—no standards for comparison of plant operations have appeared and little has been known by the superintendent of one plant regarding the relative efficiency of operation of his own installation and that of another plant of similar type operating under similar conditions.

Appreciating the value of such data in connection with the many problems of fuel conservation and its investigations into the use of producer-gas power, the Bureau of Mines decided that an effort should be made to procure operating details from a small number of representative producer-gas plants using scrubbed gas either for power or heating purposes, and that primarily data from plants using bituminous coals and lignites should be sought, but that data from a few of the larger anthracite plants and the oil and wood plants should be included.

With these points in mind, data sheets were sent to the owners of a limited number of plants, and for the most part the response has been highly gratifying. Returns of a positive character were received from 39 installations.

Although, as might be expected, a great deal of indefiniteness exists regarding many of the operating details, and few, if any, cost data are available, it is believed that in this bulletin sufficient detailed information is presented to provoke wholesome discussion on the part of those interested in this form of power; to stimulate responses to future requests from the Bureau of Mines, and to serve as a basis for comparison by the different operators of similar plants.

Principles and Methods of Valuation Must Be Such as will Attract Capital Necessary for Building New Properties and Improving Old Ones

Valuation Committee of American Society of Civil Engineers Publishes Report—Outlines Basis Upon Which Conclusions Were Reached—Defines Fundamental Principles

Guided in its consideration of the subject assigned to it by the belief that stress should be laid on fundamental principles and on general methods rather than on details which necessarily vary under different circumstances, that the discussions—unless otherwise stated—should be confined to normal properties, that valuation should have its foundation in fact, that where there are alternative methods equally fair to the parties affected, the one should be selected which is most capable of being carried out effectively under present laws as defined by the courts and which is most desirable for general use in the direction of uniformity, that recognition should be given to the interdependence of the various elements which enter into the problem, that while major attention should be given to the ascertainment of the cost of creating the property in question and its business, due consideration should be given to intangible values, and that the important item of interest—in its report meaning interest compounded annually—should always be considered, the Special Committee to Formulate Principles and Methods for the Valuation of Railroad Property and Other Public Utilities of the American Society of Civil Engineers has had published on pages 1709-1938 of the December *Proceedings* of that society, the conclusions it has reached. The following has been abstracted from this report:

Fundamental Principles of Valuation

The principles and methods of valuation must be such that, when properly applied, the result will be fair to all parties affected, and of a nature that will attract to the service of the public, the capital necessary for building new properties and for improving and extending old ones.

In the valuation of a new property, if the question of a fair return is at stake, the actual investment in the portion devoted to public use, including working capital and development expense, should be taken as the basis for "fair value." If the same property, just ready for operation, is to be valued for public acquisition, the basis of "fair value" should be the actual cost, including the money value of services and other considerations involved. If the valuation is to be used for capitalization, the result should be attained in the same way as the return base, except that all parts of the property should be included. If the valuation is for taxation, whether of a new or old property, the result must accord with the laws of the State, or, where not governed by such laws, should, to make it equitable, be fixed at a sum consistent with the valuation of other property for taxation.

Old Properties Under Continuous Regulation

In the valuation of an old property, operating without competition, and, from its inception under commission control as to rates and methods of accounting, and assumed to have been entitled to earn sums sufficiently large to provide for all expenses of maintenance, operation and taxation, depreciation allowances, and a fair return on the "fair value" of the property, the owner should be compensated in some way for losses that he may have sustained during the early years of operation before the property was turned up and the business developed, either by including in the valuation the sum of the deficiency of earnings in the early years, with interest, or by allowing higher rates of return in subsequent years to offset the early deficiency.

In the valuation of an old property which has not been subject to continuous regulation, not only are the foregoing principles important, but there are many cases in which equity calls for the inclusion of not only the sum representing the sacrifice by the owner but also a further positive or negative sum representing valuable property or rights which may have been acquired or lost by the owner as a result of time or through the failure of the public or the owner to assert their authority, the courts holding that the present value of the property should be used rather than its cost.

Physical Property to be Included in Valuation

This varies in different cases with the use to which the valuation is to be put and the laws governing.

In case of rate regulation, only the property considered to be devoted to public use should be included, embracing that which is in active use and also that which is properly and reasonably held in reserve to insure the safety, economy, sufficiency, and continuity of service. In valuation for capitalization and public acquisition it is obvious that all of the property in question should be included.

Plant units which have been definitely abandoned, and are not likely again to be used, due to having been worn out in service or by reason of the reconstruction of the property, should be excluded from the valuation and should appear, either in a separate schedule of retired or discarded property, or such full statement of the conditions should be made as will definitely fix the status of the units or parts. Temporary works necessarily built in connection with, or required for the construction of permanent works, or for furnishing service to the public at an earlier date than it could be furnished by the permanent works, should be included in the valuation.

No reduction should be made in the valuation on account of excessive size or capacity, except when the excess is so great as to be clearly unreasonable and is the result of not using proper foresight.

Lands or other property voluntarily donated to a public utility should be included when determining the reproduction cost, on the same basis as land and property otherwise acquired. In the case of leased property, either the property itself or the lease should be valued, as circumstances may dictate.

Structures located on land to which the owner of a public utility has no title should be included in the valu-

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Growth of the Natural Gas Business

The marvelous growth of the natural gas business should be interesting to every gas man. It is an inspiring example of what can be accomplished when such a convenient fuel is placed within the reach of those who can use it. Not until the mid-eighties did natural gas as a source of light, and for metallurgical purposes become important. The existence of outflows or springs of gas had long been known, and much gas was used for illuminating purposes in Fredonia, New York, as early as 1821. Not, however, until wells were drilled and the gas piped to cities and industrial centers did the consumption of the gas greatly increase. In 1882 the total output of the country had a value of only $215,000 for the entire year. During the next 26 years many cities and towns were reached by high pressure pipe lines and the consumption rose to a value of $54,640,374 in 1908. The greatest natural gas-producing states are Pennsylvania, West Virginia, Ohio and Indiana. The National Conservation Commission has estimated that the total gas-producing area of the United States is only 9,000 square miles, as compared to the total area of the United States of 3,026,789 square miles.

When one considers the very contracted area in which natural gas is produced and the fact that many of the gas wells are considerable distances from their market, this rapid growth is indeed remarkable. That without high-pressure distribution such a growth would have been impossible is self evident. That with the aid of high-pressure distribution this growth was realized should surely furnish food for thought to every gas man.

If high pressure has proven so very profitable in the natural gas field there is reason to believe that it would also prove profitable in the manufactured gas field. Those companies that have done the most work on high-pressure distributing lines have had experiences sufficiently profitable to indicate that this surmise is correct.

It is not always possible to build a gas works and operate it economically if it is placed in the center of the market area. It is also found that usually more than one market must be served if the gas plant is to be of sufficient size and have an output uniform enough to make its operation the most economical.

It is, of course, true that gas works can be located in practically any part of the country and that natural gas wells are confined to a comparatively small area. It is also true, however, that for the most economical operation the plant must be of a reasonably large size and be located where the cost of fuel, coal, and water will be as low as possible. In other words, though manufactured gas plants can be built in any part of the country their economical operation demands certain characteristics in their location, which makes the advantages that have accrued to the natural gas business

through high-pressure distribution apply to a very great extent to the manufactured gas business. . .

It would seem wise, therefore, for every manufactured-gas man to study the distribution problems of the natural-gas man. It would be wise to learn all the advantages and disadvantages of the systems in use at present. It would seem wise to profit by the mistakes and success that have arisen in the experience of the natural-gas man.

In the final analysis the problems of gas distribution are very similar whether the gas distributed is natural gas or manufactured gas. Just as pumping gas at high pressure enabled the natural-gas man to reach a large and a profitable market, so will the pumping of manufactured gas enable the manufactured-gas man to reach a new and a large and profitable market. That this is true is already being borne out by the experience of the manufactured-gas companies that are putting high-pressure distribution into practice.

Good Will

It has now become good practice to set aside a certain percentage of the annual revenue as a reserve to offset depreciation and obsolescence. In some businesses this amount also includes a certain percentage of the revenue to be used to increase the good will the company enjoys or at least to prevent its depreciating. Experience has shown that good will as well as the more tangible property such as holders, mains, office buildings, etc., will depreciate very rapidly if nothing is spent in keeping it in a proper state of repair.

The average figure which progressive and prosperous concerns, representing all lines of business, spend in building good will and increasing their business is not far from 5 per cent. This figure varies enormously, however, with different industries and different concerns. As a rule, however, that concern that spends the most enjoys the greatest degree of prosperity. We find that the range runs all the way from less than 1 per cent to 33.33 per cent.

Would it not be well for the gas industry to take an inventory of its good will and discover in just what condition it now is?

Just as no business can enjoy permanent success unless it makes provisions for replacing property that wears out or becomes obsolescent, so no business can hope to enjoy the greatest prosperity until it makes provision for maintaining good will. Concern after concern has gone down to ruin for the simple reason that this one point of good will has not received sufficient attention. The only way that funds can be made certain for repairs and replacements is by appropriating a certain amount of the revenue each year. In the same way the only sure method of building up or of retaining good will is to apportion a certain percentage of the annual revenue for this purpose and place this in hands exactly as capable of keeping good will in a healthy and growing condition as are the men who look after the tangible property of keeping that in the most efficient condition.

This matter of good will is now becoming so important that it is already often considered whenever changes in ownership take place. All companies do not carry it on their books as an asset, but who would not be willing to pay a large sum of money for the good will of the Ivory Soap Company, the National Biscuit Company, the Packard Motor Car Company, the Victor Phonograph Company or any one of a large number of other companies. The good will of each of these companies has been maintained only because in each case a certain percentage of the annual revenue has been appropriated for the purpose of preventing its good will from depreciating, and, if possible, making it grow greater and greater.

The Need of Discrimination in Selecting Appliances for Industrial Installations

Elsewhere in this issue we publish an article which describes tests indicating the advantages of a particular system of utilizing gas for an industrial operation, over a type of blast burner. This installation, while applied to a process which is, in effect, an experiment, and not as yet of real commercial importance, is significant in that it brings out sharply a need this journal has pointed out many times in the past—that, in order to result in an installation that will redound to the greatest benefit to the gas industry as a whole, careful studies must be made of every prospective installation so that the appliances will be the very best available for the purpose, and such as will result to the greatest satisfaction of the consumer, without regard to make or manufacture.

The principal business of the gas company is to sell gas. Every factor that will promote such an end must be taken into account. In these tests it will be noted that from the standpoint of gas consumed there is very little practical difference in any of the systems tested. An important difference was that the run was made in three hours less in the system selected than in the case of its nearest competitor.

The real difference lies in the degree of satisfaction to the consumer; in other words, the difference between good service and an "almost as good" service. The great opportunity for gas in the industrial field lies in our ability to apply it with greater heat efficiencies than cruder fuels, and in the possibility of controlling it to a finer degree.

In each installation we should seek to attain the highest possible efficiency. To do otherwise would be to do ourselves an injury in one of our most promising fields.

For this reason the fine distinction emphasized in this article, between good service and "almost as good" service assumes a degree of importance that cannot be ignored.

(*Continued from page 35*)

ation of the property where the owner has been required by law or necessity to pay their cost, including in this class also property voluntarily donated, and they should be excluded where other public service companies, the public, or the users, other than the owner in question, have been required by law or necessity to pay their cost.

Working Capital.

It is customary to include under the term "working capital" the amount of cash, materials, and supplies, provided for use in the plant, but not yet forming a part of it, and other current assets which are essential for the proper maintenance, operation, and administration of a property. There should be included in a valuation an amount of working capital sufficiently large, not only to meet the usual requirements, but to provide for emergencies. Ordinarily, the valuation of property devoted to public use should not include securities owned, or surplus cash not forming a part of working capital except in instances where such securities and surplus cash are an offset, in whole or in part, for depreciation deducted from the cost of the property.

Original Cost to Date

As defined by the committee, this is the first cost of the identical property units now in use, including overhead charges. While much of the difficulty of determining original cost as thus defined in some cases may be removed, especially in the case of short-lived property, it is not feasible to obtain a dependable result where the absence of reliable historic data makes necessary a resort to estimates, as in the case of old properties consisting mainly of long-lived items.

Generally, it will be found necessary to prepare a schedule in the same way that one would be made for determining the cost of reproduction, many adjustments in the records often being required even under the most favorable conditions, in order to obtain correct results.

When a schedule is necessary, the corresponding costs or unit costs are essential to the completion of the inventory, and where these are unobtainable, as is usually true in the case of property units acquired or created long ago, the ascertainment of the original cost is impossible.

Overhead charges are recited at length in the section relating to cost of reproduction. They are inadequately reflected in the records as a rule, and therefore adjustments are required which are largely matters of opinion and speculation, and which, in consequence, makes more uncertain the final result, thus often destroying its usefulness.

The expense, actually incurred in connection with the tuning up and creation of the business of a property, should be included as a part of the original cost to date.

Cost of Reproduction

Estimates of the cost of reproduction should be based on the assumption that the identical property is to be reproduced, rather than a substitute property; that while apparent present-day conditions that would affect the cost of reproducing the property, must be considered in any logical estimate, yet history must also be considered to determine what is to be reproduced, the conditions under which it is to be reproduced, and how the estimates must be made; that for all those items concerning which there can be no doubt the engineer should use the basis plainly applying, and that for those that are doubtful, or have been questioned, he should present the effect of the use of the different bases clearly, that the determining body may have the data for a wise decision and that normal present conditions shall determine the prices and methods for doing the work.

The first step in estimating the reproduction cost of a property is such a study of the property and its history as will enable the estimator to make a complete list of all items, lay out a proper financial and construction programme, and fix proper unit prices to the several items of the schedule, after which the property should be divided into groups of items or units which will lend themselves to the depreciation study and accounting, preferably following some well established classification of accounts.

The field schedules and inventories, suitably recorded on appropriate forms, shall be based not only on full and complete surveys and inspections of the visible physical property, but they should also reflect a careful historical search of existing records of original conditions, and other reliable sources of information bearing on items of material or work which entered into or were incidental to actual existing units, special care being exercised to exclude that which is not capable of definite proof, and to limit the speculative uncertainties as far as possible.

In determining unit prices a rational sequence of construction should be assumed for the reproduction of a property, and rational assumptions should be made as to the manner of doing the different parts of the work, whether by the forces of the company or by contract. Unit prices based, where possible, on the actual cost of doing similar work, in a similar manner, under similar circumstances should be determined by persons of experience and sound judgment. They should be based on the normal average cost of work for a considerable period—say, 5 or 10 years—in order to give stability to the valuation, so that it may be used for a subsequent terms of years. In the case of items which are steadily increasing or decreasing in value, the prices adopted should be normal for the time of the valuation. Full consideration should be given to the time allowed for construction, to climatic conditions and to the effect of any other significant conditions or limitations upon the cost of the work.

Land Holdings

Separate parcels of land such as one or two lots, or a tract of not unusual size, not connected with other lands of the utility in a strip or body, and where freedom of choice in selection may be exercised, should be valued on the same basis as other lands in the vicinity, used for general purposes.

Where large tracts have been acquired, made up of a number of separate entire parcels, the history of the transaction should be completely investigated and allowance made in the estimate for cost of vacation of streets, or acquisition of other rights incident to the use of the property as a whole. Such further allowance should be made, as may seem to be justified by experience, to cover excess costs over and beyond the normal market values which existed at the beginning of the project, and which were due to fluctuations of price or other causes beyond control. Normal market values of similar and nearby property, as of the time of appraisal, should be the basis, with such additions as were warranted by the investigation in each case.

A determination of the relation existing between actual recent acquisition costs and the normal market value of the lands out of which the strip or parcel was taken at the time of acquisition is undoubtedly possible in many cases. It would seem that where such relation can be determined, its use in connection with the normal market values of these or similar lands at the time of appraisal should establish a reasonable cost of reproduction.

The determination of the figure to be used should be based in all cases on full consideration of the present normal market value of the area of land acquired and of other recent purchases by the same or other companies of similar lands in the vicinity or in districts of like characteristics; the damage to the remaining land, not required, due to severance and all consequential injuries; the amount and character of the costs of acquisition and overhead charges; enhanced prices due to active demand; and any other real item of cost which would be included in case of purchase. But no allowance should be included for special values coming after the acquisition of the property on the new use, or on account of a greater earning power under the new use, or for any other hypothetical "value."

Estimates should be based on prices and values as of the time of appraisal, be they higher or lower than those prevailing at the time of original acquisition. The thing sought in reproduction is the fair cost of acquiring the property as of the date of valuation.

The treatment of the valuation of land holdings is not yet thoroughly crystallized, therefore the valuing engineer will do well to confer with counsel upon the interpretation of past court decisions and the legal principles which are most fairly applicable to the case under review.

Overhead Charges

There are certain expenses called overhead charges, inseparable from the construction of any property, which are a necessary and proper part of its cost, but which are not capable of physical identification after the completion of construction work. These expenses cannot be covered in the estimate of "Cost of Reproduction" by the application of specific unit prices. From their nature they attach to the whole or large parts of the property rather than to any particular units.

Among the expenditures which must be provided for, and classed as overhead charges are:

Cost of promotion.

Cost of financing and securing the necessary capital with which to carry out the enterprise.

Cost of organization, including the incorporation and organization of the company, securing of franchises, and other like expenditures.

Engineering, including the making of the preliminary investigations and plans, plans for the construction of the entire property, the engineering supervision of all construction and other work involved in the development of a property, except such direct supervision as may properly be included in the unit prices of various property units, or as specific charge against some particular schedule or group of units.

Administration, including salaries for general officers, agents, accountants, clerks, and other assistants, not included in the engineering and legal department, and all administration expenses.

Legal, including salaries and expenses of law officials and costs of litigation which, depending on the character of the property and its location, may be a comparatively minor item or a very large one.

Interest during the period of construction, on money borrowed, or on money invested in the property by its owners.

Taxes and insurance during construction.

Contingencies, representing expenditures which cannot be foreseen but which, from one cause or another, are always of considerable size in the construction or reproduction cost estimate of any great enterprise.

Depreciation and Appreciation

With a desire to remove the ambiguity and resulting confusion that has attended the use of the term "depreciation" in connection with valuation, the committee considered the subject of depreciation and appreciation from three standpoints: The cause, decretion or loss of service life; the record, accounting depreciation, or the money allowance made in bookkeeping to offset accruing loss of service life, and the amount sought, depreciation of valuation or fair depreciation, the sum which should be deducted from original cost to date or from estimated cost of reproduction new as a step in finding that which the courts have called "fair value."

Decretion is the fact of loss of service life of a physical property, or property unit, or item, regardless of its effect on value or anything else. It may be due to use, or inadequacy, or obsolescence or accident, either singly or in combination in a given plant or plant unit.

Although, in a well-maintained property, decretion is always present in some degree, yet in some cases this decretion, converted into loss of value, which loss is hereafter called cost of decretion, should not be considered to be a deductible quantity in finding the value of the property; that is, it should not be considered as depreciation of valuation, or fair depreciation. Unfortunately this has not been entirely understood.

Whether or not, and to what extent, if any, the loss of value due to existing decretion shall be deducted from original cost to date or cost of reproduction new, when finding "Fair Value" for any purpose, is the great troublesome problem of depreciation in valuation.

Accounting Depreciation

The fundamentals of the methods of accounting for depreciation are that the owner of a public utility is under obligations to the investors in its securities to maintain the integrity of the investment as a continuing property and to furnish suitable service to the public; that the public is under obligation to the owner to pay a fair price for the service rendered, which should cover all operating expenses, a proper allowance for depreciation and a fair return upon the "Fair Value" of the property; and that the return to the investor and the rates to the investor and the rates to the consumer should be kept reasonably stable and uniform from year to year, and should be fair.

The four accounting methods in use for accounting for depreciation, the replacement method, the straight-line method, the compound-interest method (formerly called by the committee the "equal-annual-payment method"), and the sinking-fund method, yield identical total costs when the whole life of a property unit is considered, and any one of them seeming to be the most convenient may be chosen, provided only that under the circumstances it is legal, safe, and fair.

The replacement method is applicable to those short-lived properties or parts of properties made up of a large number of items, the replacement or retirement

of which proceeds after a time with fair regularity and causes no troublesome variations in return or service rates. The straight-line method applies to any property units having more than a year of service life, which are assumed to depreciate uniformly from the beginning to the end of service life. The compound-interest and sinking-fund methods apply to property units the depreciation of which is assumed to progress at the same rate as a sinking fund grows from an annuity, accumulating at compound interest.

In addition to these four methods there is the unit cost method, eminently sound in theory but not readily applicable to accounting purposes, which is based on the conception that the value of a plant unit should be decreased from year to year to such an extent that the cost per unit of output or service, taking into account all annual charges for interest, depreciation, repairs, cost of operating, etc., should be constant during each year of the estimated service life of the unit.

The great discrepancy in the growth of depreciation of long-lived units under the straight-line and compound-interest theories should be carefully noted when determining which method to use.

The report is particularly concerned with depreciation accounting as it relates to valuation, and the determination of the depreciation of valuation. It would seem to be fair in any given case to give the method of accounting used by the utility in setting up depreciation allowances, its proper effect in determining deductible depreciation or the depreciation of valuation.

Depreciation of Valuation Dependent on Accounting Methods and Regulations

Finding the cost of decretion, here defined as the loss of service life of an item converted into loss of value, is a step in the determination of depreciation, but whether and to what extent if at all, the estimate thus found shall be treated as depreciation of valuation may be, and very probably will be, dependent, at least in part, on the methods of accounting for depreciation and the character of regulation that have prevailed.

If by order or sanction of a regulating body, or by long-continued proper custom under no regulation, a property, as for instance a railroad, has been maintained in normal working condition, necessarily less than new in some or all of its parts, by the replacement method, and at any given date is being valued for any public purpose, and at that date shows normal condition, all its several parts being in as good condition as could be expected, the accounts showing that those amounts have been expended in renewals that were necessary to keep the property in normal working condition, and the fact appearing that no expenditure reasonably to be expected could put the property in better than the normal condition in which it is found, and that no unusually large expenditure is presently to be necessary for this purpose, then, in spite of the fact that there is an existing decretion in its several parts, there should be found no depreciation of valuation. Under the method of accounting, the public has not paid, and could not pay, for the accrued depreciation, and under this condition its accrued obligation to pay should be considered an asset of the company owner.

If parts of the property are maintained under the replacement method and part by some proper allowance method, except as noted below, then depreciation of valuation should be found with respect to those parts maintained under the allowance method, but this depreciation of specific physical units will be made good in whole or in part by existing funds or property purchased with allowances, either or both of which will be included in the valuation as they are found.

If in the judgment of the valuing engineer, the replacement method may not be used with propriety for a given property, either because not in accordance with law, or because the method is not adapted to the property, then, whether or not the property has been maintained in the past under this method, the valuing engineer should estimate depreciation of valuation in the amount of the cost of the decretion he finds. There can be no certainty that the property will be properly maintained in the future.

When a comparatively new property, other than a railroad, is to be valued, and it has not been under any regulation that has affected its accounting methods, the law as laid down in the Knoxville decision would seem to make it necessary to find depreciation of valuation in amount equal to the cost of decretion found for all items, whether or not maintained by the replacement method. The committee, however, believes that this may work hardship and injustice in some instances, and suggests that in such cases the facts be reported with such recommendation as to equity, as may seem fair to the engineer.

Depreciation of Valuation Under Allowance Methods

If either the straight-line, compound-interest, or sinking-fund method has been used in computing depreciation, and the method of accounting for it has been prescribed by a regulating body or voluntarily followed by a company owner from the beginning, the same theory, so far as it applies to the property in question, should be used for estimating the cost of decretion; and the entire cost so found, lessened by any accumulated depreciation funds, will appear as depreciation of valuation, unless the sinking-fund method of accounting has been used.

In the latter case, if the valuation has to do with the reasonableness of the return and the accounting is to go on as before, apparently existing depreciation would not be depreciation of valuation, and therefore would not be deductible, but if the valuation has to do with condemnation or purchase, then, as in other cases, the apparently existing depreciation is depreciation of valuation, and the owner should receive the depreciated value of the physical property and the existing fund.

Effect of Regulation on Depreciation of Valuation.

Regulation which determines the method of accounting will in part determine the amount of depreciation of valuation when finding "Fair Value" because it determines the method by which the public shall pay for the loss of service life. If the regulating body has prescribed the replacement method for the whole period that units have been in existence, then, although depreciation may exist, it is not depreciation of valuation, because, under the method of accounting, the public has not paid, and could not pay, for the accruing depreciation, and is still under obligation to pay for it.

Methods of accounting in force at the present time which make proper provision for the accruing depreciation should not have full weight, if, in previous years during the life of the property units, other methods were in use which did not make provision for such de-

preciation. The amount of depreciation of valuation in such cases should be equivalent to the accumulated contributions of the public for depreciation allowances under the various methods of accounting which have affected the property unit from time to time. The public is still under obligation to make good that part of the loss of service life not yet paid for, and this obligation should be considered to be as much the property of the company, usable to offset accrued depreciation as renewal funds or property actually in existence.

Whether or not this reasoning will stand in any case is for the court to determine. Valuing engineers and accountants should report what they find as to the actual cost of decretion, and the sums which have been received to offset such cost, under the methods prescribed by the regulating body from time to time. They may give their opinions as to the amount of depreciation that should be deducted from cost to find cost less depreciation as an element in the quantity known as "Fair Value."

If regulation has not fixed accounting methods, but has limited the earnings, it should be permissible to inquire whether the limited earnings have been sufficient to pay operating expense, depreciation, and fair return. If so, depreciation found should be considered depreciation of valuation to the extent warranted by the accounting methods lawfully or properly followed; if not, a question arises.

It is remembered that the duty of the company owner is first to maintain the property "before coming to the question of profit at all," and that it is the duty of the regulating body to see that rates are such as to permit the company owner to earn operating expense, depreciation, and fair return.

If the regulating body has made sufficient earnings impossible, is it still the duty of the company owner to maintain the property before paying a fair return to its security holders? If it is, depreciation of valuation should be found in the amount of the total cost of decretion or so far as warranted by the accounting methods followed. If not, depreciation found should not be considered depreciation of valuation, except to the extent covered by earnings after deducting operating expense and fair return. This is a matter of equity to be determined by a court.

If, under regulation, the property is a losing venture, it is not included in the class of properties now being considered. In any event the depreciation existing should be found and reported, together with all pertinent facts, that the court may determine the equities of the case.

Conclusion upon Depreciation.

The valuing engineer should always bear in mind that when a company owner has invested a reasonable sum in a property for public service it is entitled to, but of course not guaranteed, a fair return on its investment, so long as the money remains in the property, either as property, or funds, or accrued public obligations to pay.

Therefore, so long as the company owner keeps a sum equivalent to the total investment at work for the public, either as property serving the public, or funds held in reserve for such property, no policy should be followed in estimating depreciation that will reduce the property to a value less than the investment, or, when using cost of reproduction less depreciation, as a basis of "Fair Value," to a value less than the cost of reproduction of that part of the property estimated to have been created with company funds, acquired by gift, or in any way not the result of public contributions to cover depreciation.

Appreciation, largely the result of solidification, seasoning and adaptation, represents the improvement in quality and usefulness of certain parts of the physical properties of a railroad or other public utility property, and it results from the lapse of time, from work not specifically charged to capital account, from maintenance, from use, etc., and covers items, not represented either by the quantities or unit prices, that are determined in connection with a valuation.

There should be no general setting off of appreciation against depreciation, but appreciation should be determined independently from depreciation. Care must be taken that items of labor and expense which are included in the estimate may not be duplicated in development expense.

Development Expense.

In the production of a normal going property, development expense, almost invariably, is an unavoidable real cost, and is measured by the difference between the amount of which the company is entitled to earn in the early years and the amount which it actually does earn. The portion of this expense incurred in tuning up the property and bringing it to its present state of operating efficiency may be included in the cost of construction, and the remainder may be treated as the cost of acquiring the business.

The intangible value that pertains to a property and should be given due weight in the ascertainment of "Fair Value" is the difference between the tangible value—that is to say, proper cost, including development expense, less depreciation of valuation and exchange value, in which is reflected existing and potential dependable income and beneficial results. It embraces going value, in which is merged good will, franchise value, efficiency, favorable business arrangements and design, and it also includes other elements, such as leases, easements, water rights, traffic and operating agreements, strategic location and advantages, and other privileges.

Incidental Dangers Arising During Employment, Risks Employee Takes Upon Himself

In the case of an accident to an employee arising from some defect in a tool or appliance the employee does not establish a right of recovery by mere proof of the occurrence of the accident and of his consequent injury, according to a recent decision laid down in the Supreme Court of Pennsylvania in the case of Weaver vs. Wohlsen.

It must be shown that the employer was aware of the flaw or would have known of it if reasonable and proper inspection had been made. Where a defect arises in the course of the use of tools or appliances, the employer is not responsible for such defect in the absence of proof of sufficient time and opportunity to discover the flaw. Such incidental dangers arising during the course of employment are risks which the servant takes upon himself. He has better means of observing the imperfections than has the employer, and it is his duty to use proper care to discover them, and, when discovered, report them to his employer.

Lead Production Makes Record Gains in 1916

The lead industry in 1916 made good gains in output, both in mining and smelting, according to the U. S. Geological Survey. The lead content of ore mined in the United States in 1916 was about 622,000 short tons, compared with 561,639 tons in 1915, an increase of 60,000 tons, or over 10 per cent. The average price of lead in 1916 was so much higher than in 1915 that the increase in value of the mine output of lead was about 50 per cent.

The production of refined lead, desilverized and soft, from domestic and foreign ores in 1916 was 579,600 tons, worth at the average New York price $78,826,000, compared with 550,055 tons, worth $51,705,000, in 1915, and with 542,122 tons, worth $42,286,000, in 1914.

The figures for 1916 do not include an estimated output of 21,800 tons of antimonial lead, worth approximately $4,283,000, compared with 23,224 tons in 1915 and with 16,667 tons in 1914.

Of the total production, desilverized lead of domestic origin, exclusive of desilverized soft lead, is estimated at 324,000 tons, against 301,564 tons in 1915 and 311,069 tons in 1914; and desilverized lead of foreign origin at 21,400 tons, compared with 43,029 tons in 1915 and 29,328 tons in 1914. The production of soft lead, mainly from Mississippi Valley ores, is estimated at 234,200 tons, compared with 205,462 tons in 1915 and 201,725 tons in 1914. The total production of desilverized and soft lead from domestic ores was thus about 558,200 tons, valued at $75,915,000, compared with 507,026 tons, valued at $47,660,000 in 1915, a gain of 51,000 tons. Of this gain in domestic production, about 29,000 tons was made in soft lead and 22,000 tons in domestic desilverized lead.

In consequence of the great demand for lead a considerable quantity of secondary lead (about 7,000 tons) and secondary antimonial lead (over 5,000 tons) was recovered at the regular smelters.

The final figures for the production of soft lead will show an increase of a few thousand tons over those here given, for the reason that the smelters and refiners of argentiferous lead undoubtedly treated more or less soft lead ore from the Mississippi Valley which in their preliminary estimates is not distinguished from silver-lead ore.

The imports of lead are estimated at 20,600 short tons of lead in ore, valued at $1,575,000; 9,200 tons of lead in base bullion, valued at $1,091,000; and 6,000 tons of refined and old lead, valued at $803,000, a total of 35,800 tons, valued at $3,468,000, compared with 51,496 tons in 1915. Of the imports in 1916 about 19,500 tons came from Mexico, against 47,124 tons in 1915.

The exports of lead of foreign origin smelted or refined in the United States showed a great decrease. They were estimated at 9,350 tons, worth $3,468,000, against 38,445 tons in 1915 and 31,051 tons in 1914. This does not include foreign lead manufactures exported with benefit of drawback, which amounted to 4,744 tons in the first half of 1916. For the last three years notable quantities of domestic lead have been exported to Europe, and the total for 1916 is estimated at 108,200 short tons, valued at $14,787,000, which is certainly a great increase when compared with 87,092 tons, valued at $7,796,998, in 1915.

The amount of lead available for consumption during 1916 may be estimated by adding to the stock of foreign lead (domestic stocks are not known) in bonded warehouses at the beginning of the year (12,169 short tons) the imports (about 35,800 tons) and the domestic production (558,200 tons), making an apparent supply of 606,169 tons. From this are to be subtracted the exports of domestic lead (108,200 tons), the exports of foreign lead (about 9,350 tons), the foreign lead contained in articles exported with benefit of drawback (about 9,000 tons), and the stock in bonded warehouses at the end of the year (assumed to be the same as at the end of November, 8,387 tons), leaving as available for consumption 471,200 tons, compared with 426,751 tons in 1915.

Lead began the year at New York with a price of 5.5 cents a pound, the minimum price of the year, and rose to 8 cents early in April, this being the maximum figure. A long decline carried the price down to 5.95 cents a pound in the early part of August. Another rise reached 7 cents about the middle of September, after which the price remained stationary until early in December, when it advanced to 7.5 cents, and it closed the year at about that figure. The average New York price for the year was 6.8 cents, compared with 4.7 cents in 1915, 3.9 cents in 1914, and 4.4 cents in 1913.

Few Tests Find Canadian Gas Companies Below 520 B.t.u. Standard

In only 24 tests made by the Inland Revenues Department of the Dominion of Canada during the year ending March 31, 1916, was the gas being supplied by Canadian gas companies found below the 520-B.t.u. standard established as a minimum for calorific tests. A total of 2249 tests were made, the majority resulting high above the required amount. The yearly average of the Charlottetown Light & Power Company, of 710 B.t.u., was the highest yearly average maintained. This plant manufactures coal gas.

Pig Iron Production in 1916 More Than 900,000 Tons Greater Than in 1915

The January first estimates of shipments of iron ore from the mines during 1916 are 75,500,000 gross tons, compared to 55,493,100 tons for 1915, according to the United States Geological Survey. Not only are these record-breaking figures, but the ore sold for $178,935,000, an increase of over $77,000,000 compared with 1915. Ore in stock at the mines approximates 10,486,000 gross tons, compared with 13,748,000 tons in 1915.

Production of pig iron also made a record in 1916 with a total of over 39,000,000 gross tons, compared with 29,916,213 tons in 1915.

Authority of Salesmen to Make Contracts Limited

Persons dealing with salesmen are legally bound to take notice of limitations on their authority, the West Virginia Supreme Court has held in the case of the Toledo Scale Company vs. Bailey. When a representative of a manufacturer is authorized merely to secure orders from customers to be approved or rejected by the manufacturer, he cannot make a contract for an absolute sale binding on his employer.

News of the Gas Industry

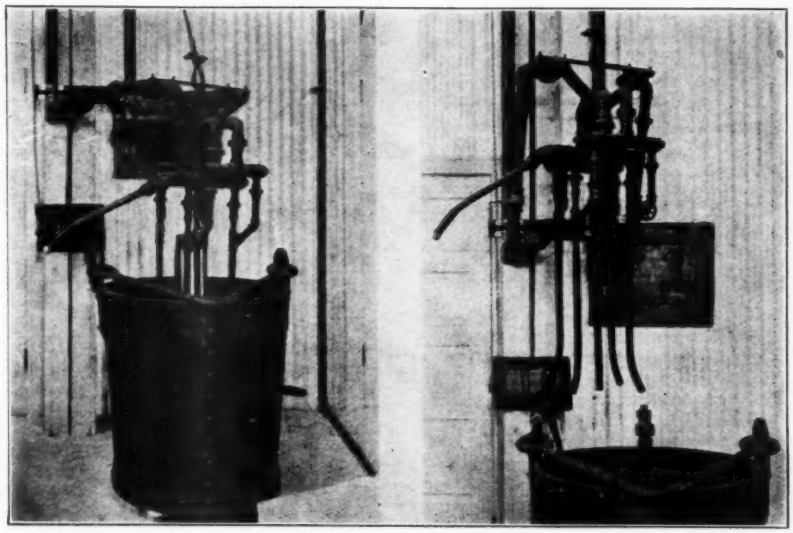
Baltimore Company Makes Installation for Molding and Annealing Lenses

Is the First Installation of the Kind Made in That City—Special Burners Designed for Preheating Ladles and Molds at Steel Plant

The industrial fuel business of the Consolidated Gas Electric Light & Power Company of Baltimore, has reflected the decidedly increased business in the confectionery trade during the past month as well as increased demands from house-heating propositions, hospitals, garages, etc.

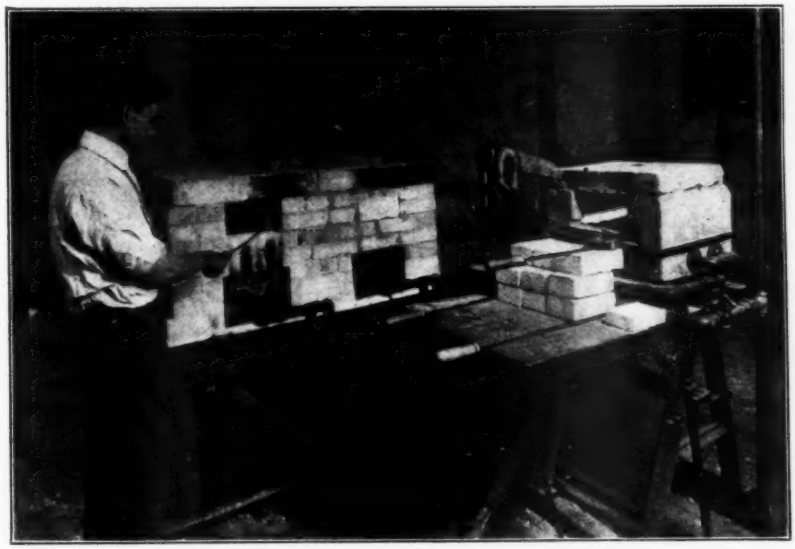
Several industrial applications of gas heating were made which required the design of special new burners by members of the industrial department.

At the new plant of the Tungsten Steel Products Company, where Consolidated Electric Service is used on a larger scale for the operation of the melting and refining furnaces, there has been installed gas-fired equipment for the preheating of the ladles and molds into which the hot metal is poured. The gas burners for this equipment were especially designed for the purpose.



EQUIPMENT FOR PREHEATING LADLES AND MOLDS HAVE SPECIALLY DESIGNED BURNERS

The Bisight company, manufacturers of one-piece bifocal lenses, has recently installed 3 gas furnaces for molding and annealing the curved lens. Glass of the proper index is heated to a high temperature, placed in a mold under pressure to obtain the proper curvature, and then annealed. It is then ground according to the optician's prescription. This shows another application of industrial gas and one point of interest about the installation is that it is the first of its kind in Baltimore.



THREE GAS FURNACES USED FOR MOLDING AND ANNEALING CURVED LENSES

Two North Carolina Gas Companies to be Sold Soon

The New Bern Gas Company, operating in New Bern, Craven County, N. C., and the Goldsboro Gas Company operating in Goldsboro, Wayne County, N. C., are each to be sold to the highest bidder very shortly. The former will be sold at the Court House at New Bern at 12 o'clock, January 10 and the latter at the Court House in Goldsboro at 12 o'clock, January 15, 1917.

Chicago to Reduce Lights

Chicago will have less light during January. A curtailment has been made necessary by the lack of funds and the shadow will fall on the outlying districts. This, we are afraid will give the districts affected a touch of the wartime darkness experienced abroad.

The department of gas and electricity, like other departments of the city government, has been directed to make a specified saving in expenditure during that month. It was an order of the city council and is to be effective during the consideration of the new budget.

"It will be necessary for us to reduce the number of street lights by 25 per cent.," said W. G. Keith, commissioner of gas and electricity. "We will be expected to save $18,000 on our lighting bill. The only way we can do that is to cut down the number of rented lights. They are the gas and gasoline street lamps and the electric lamps rented from the Commonwealth Edison people. I have notified the companies that the reduction will be made on January 1. It will affect the outlying districts only.

"The service of street lamps in the middle of the blocks will be suspended. Corner lamps will be continued."

Bill Filed to Combine Gas and Service Boards

Reorganization of the public service commission and the gas and electric light commission was proposed in a bill filed recently with the clerk of the Massachusetts House of Representatives by Representative J. Weston Allen of Newton.

Instead of the two commissions, Mr. Allen would have a single board of seven members, each of whom, except the chairman, shall be paid a salary of $7500, the chairman to receive $8000. The members are to be appointed for terms of seven years each, and one of the number shall act as secretary.

Among the purposes to be served by such a reorganization, according to Representative Allen, is the payment of adequate compensation to all the commissioners, with a saving in the salary account of the two present boards of $9000. The quarters of only one will be necessary, thus reducing the amount of office space. The office force, too, can be reduced, resulting, according to Mr. Allen, in a saving to the state of $25,000 or $30,000 a year.

The bill provides that the chairman of the board would appoint four sub-boards, as follows:

The railroad board, with jurisdiction over all matters relating to steam railroads and steamships.

Street railway board, with jurisdiction over all matters relating to street and elevated railways and electric railroads.

Gas and electricity board, with jurisdiction over all matters relating to gas, electricity and water supply.

Telegraph and telephone board, with jurisdiction over all matters relating to telephone and telegraph.

Each sub-board would consist of three members, which would make it necesssary for each member of the full board, with the exception of the secretary, to serve on two such sub-boards.

The sub-boards would hear all matters coming within their jurisdiction, and their decision would be final, except that the chairman is authorized, if such action is necessary, to have the full board of seven members hear any particular question or questions.

Increased Gas Output

The output and new business of all Byllesby properties, in all of which Standard Gas & Electric Company owns a controlling or important interest, continue to show material gains in both gas and electric departments. The electric output for the week ending December 15 is reported as 6,655,700 kilowatt hours as compared with 5,669,000 kilowatt hours during the corresponding period a year ago, an increase of 17.4 per cent. Gas output for the same period was proportionately large, being 48,799,000 cu. ft., an increase of 17.1 per cent.

Discussion of Gas Tubing Law

Discussion of an ordinance regulating the sale of gas tubing was to be the chief business at the next meeting of the municipal committee of Newark, N. J. Health Officer Craster, Lieutenant Godfrey of the prosecutor's office; Gas Meter Inspector Francisco and representatives of the Public Service Gas Company of New Jersey were to attend the session and co-operate with Captain Gasser, of the Bureau of Fire Risks, and Building Superintendent O'Rourke.

This action is contemplated with a view of eliminating the danger attending the use of cheap and leaky hose, which has been responsible for eleven deaths since December 17. Captain Gasser has drafted an ordinance which would limit the sale of gas hose to that kind manufactured of flexible or rigid metal.

The safety committee considered such action at a meeting in November, 1915, and passed a rule calling for such tubing. The rule is not effective. The proposed flexible or rigid metal, it is said, would lessen fire hazard.

The Bureau of Standards at Washington, and the National Association of Gas Men are working on a code for regulating gas appliances. It has been suggested that the local authorities wait until this code is adopted. It is probable that the ordinance after being discussed will be offered to the common council.

Officials of the Public Service Gas Company have signified a willingness to assist the authorities in the move for the regulation of the hose and will present samples.

Gas Company Bonus List Increases

One hundred and fifteen employees of the Tampa Gas Company, including all those who have been with the company more than six months, recently shared in the first distribution of the company's "Employees' Savings Fund" amounting to more than $1000.

January 1 last, the company adopted a plan whereby it set aside, every month, a sum equal to 2 per cent. of the employee's salary for the month, to accumulate into a fund for a Christmas bonus distribution to its men.

In other words, an employee receiving $100 a month salary, has $2 per month put aside for him throughout the year, to be paid him as a Christmas gift by the company at the end of the year.

A month's salary is the bonus Christmas gift that gladdened the hearts of the employees of the Ohio Cities Gas Company. The company announced that the bonus affects all employees receiving $3000 or less and will cost the company a total of $35,000.

The Union Natural Gas Corporation, of which the Citizens' Gas Company of Elyria, Ohio, is a part, gave their employees a check equal to one month's pay and a salary bonus of $12.50 besides.

Illinois Commission Acts to Relieve Coal Shortage

The inability of the railroads to furnish sufficient cars to move the existing volume of coal business appears to be the root of the present coal shortage, which is now giving many public utility enterprises no little concern. In the State of Illinois it became apparent that unless some relief was afforded, numerous isolated electric utilities would be forced to cease operations due to their inability to secure coal. To relieve the general coal shortage which is prevalent over the entire state, the Public Utilities Commission of Illinois has issued to all railroads operating within the State of Illinois orders which require all railroad companies operating within the State of Illinois to promptly return all coal cars received in interstate commerce to their owners, after such cars have been unloaded and made empty, unless it should happen that such cars can be immediately loaded for return to the owner. Another order provides that all railroad companies operating within the State are authorized to put into effect, on one day's notice, a change in Rule 7 of Demurrage Tariffs now on file with the commission, which shall apply only to interstate shipments of coal and coke in Illinois. The change thus authorized provides for a demurrage charge of $1 for the first day after the expiration of the free time allowed for unloading, $2 per car for the second day, $3 per car for the third day, $5 per car for the fourth day and every succeeding day. Authority is also given to publish such changes, in other demurrage rules, as are provided for in the order issued by the Interstate Commerce Commission. Order 34 further provides that the changes authorized in the demurrage rules filed in compliance with the order, shall remain in effect until May 1, 1917.

How to Pile Soft Coal with Safety Described by Experts

In a bulletin issued from the Boston office of the National Fire Protection Association, are suggestions for the safe storage of bituminous coal. The association reports a larger number of fires from spontaneous combustion than usual the present year. The storage of bituminous coal, says the bulletin, involves a distinct and unavoidable hazard. The following safeguards are suggested:

1—Storage should be as far as possible from plant buildings and never against frame buildings.

2—If space permits, piles should not exceed 12 ft. in height.

3—Wet coal should be piled around the edges of the storage, where air can get to it freely.

4—Pipes 3 or 2 in. in diameter should be inserted, with lower ends at different levels. Pipes should preferably be perforated. One 3-in. pipe to 400 sq. ft. of surface is sufficient.

NO COAL IN LAUNDRY
An 8-horsepower gas-fired steam boiler has been installed in Frost's Hand Laundry, 198 Massachusetts Ave. This is additional to a 3-horsepower boiler.
GAS BEATS COAL
The Boston Globe
Adds ANOTHER 6-ton stereotype pot and two 3-ton slug pots to its gas-fired equipment.
STILL THEY COME
MORE GAS STEAM RADIATORS
H. A. Peck, printer, 48 Union St., has just ordered eight radiators to heat 32,000 cubic feet.
HOT WATER
325 Gallons an Hour for 8-100 Cents a Gallon
This order has just been placed by Joseph L. Klein for factory at 60 High St.
GAS HAS 1000 USES
LET US FIND A NEW USE FOR YOU
Boston Consolidated Gas Company
Industrial Fuel Dept.
Reprints from Our Current Newspaper Advertising
NO COAL IN KITCHEN
Boston College Is Installing
Two sections of hotel range and boiler.
Gas Reduces High Cost of Living and Doing Business
In view of the high price of coal and the fear that some day their business may suffer from interrupted supply, many firms in the manufacturing and wholesale districts are turning to gas as a fuel. This is true for domestic service also, where gas is fast displacing coal.
OUR OUTPUT OF GAS SINCE SEPTEMBER 1ST HAS INCREASED OVER 160,000,000 FEET ABOVE THE CORRESPONDING OUTPUT OF LAST YEAR, AND WE DOUBT A LARGE PERCENTAGE OF THIS IS USED INSTEAD OF COAL.
Everything is going up nowadays—coal, food and other necessaries of life. In recognition of this increased cost of living we have just allowed our employees additional compensation of 10%, beginning January 1st, 1917.
This is in addition to the stock distributed under our Profit-Sharing Plan, which amounts to the equivalent of 8⅓% more.
Although the cost of materials and labor which enter into the manufacture and distribution of gas has increased like everything else, the price of gas has not been advanced.
Compare the prices of gas with those of coal. Ten or twelve years ago, 6750 feet of gas cost the same as a ton of coal, while today 11,876 feet of gas can be bought for the price of one ton of coal. This is a difference in favor of gas of over 75%.
If you are using coal for domestic or business purposes, you had better get in touch with us and see if it won't be for your interest to use gas instead.
CONNELL & McKONE
Distributors of Overland Cars
Have just bought of us a gas oven 16½ ft. x 14½ ft. They are going to run automobiles into this oven to dry paint.
GAS REPLACES COAL IN THE GLOBE
6-ton Metal Melting Pot in the stereotype room of the Boston Globe is being changed from coal to gas.
MORE STORE HEATING
15 GAS STEAM RADIATORS
Have been ordered by H. S. & M. W. Snyder to heat the entire top floor of their store at 68 South Street.
ALL GAS KITCHEN for PRIVATE HOTEL
Catlin & Clapp, 122 Newbury St., are installing two sections hotel ranges, broiler, bake oven, toaster, water heater.
ONE ORDER for 23 GARAGE HEATERS
has been received from Druker & Radnick. These heaters are to be placed in the garages of their High-Class Apartments near Coolidge Corner, Brookline.

Effective Newspaper Campaign Carried On by Boston Company

"Gas Has 1,000 Uses" is the slogan carried out in a campaign originated by the Boston Consolidated Gas Company, and run in the New England newspapers. Each one of the advertisements in the accompanying illustration was displayed at different times, and then combined in this effective manner in half-page space.

Each ad. showed the various uses of gas for industrial fuel installations, as follows:

An 8-horsepower gas-fired steam boiler has been installed in Frost's Hand Laundry. This is additional to a 3-horsepower boiler.

Connell & McKone, distributors of Overland cars have just bought of us a gas oven 16½ ft. by 14½ ft. They are going to run automobiles into this oven to dry paint.

Six-ton metal melting pot in the stereotype room of the *Boston Globe* is being changed from coal to gas.

Auburn Gas Plant Sold

The Cavanaugh Gas Company of Auburn, Ill., the only gas plant manufacturing gas for commercial purposes from wood, has been sold by Samuel Cavanaugh to a company of capitalists of which Eugene Kuhne is president. A majority of the members of the new incorporation, which will be known as the Valley Gas Company, are Chicago men.

Mr. Kuhne has a number of patents on the manufacture of gas which he will put into operation in the enlarged plant which is to be built here. A recent successful experiment he made here was to gather up the slops and refuse from the hotels and restaurants and make a gas that tested better in the laboratories than does the wood gas, which Auburn people find superior to coal gas.

The new company, among many other plans, expects to build a laboratory, with a view to extensively engaging in the manufacture of by-products from mill waste, which the new owners, after carefully considering the field feel confident can be profitably carried on in this district.

Massachusetts Companies Ask Board's Approval of Stock Issues and Service Extension

The Greenfield Gas Light Company has petitioned the Massachusetts Gas & Electric Light Commissioners for approval of a proposed issue of $166,000 in 5 per cent. 30-year bonds.

The Adams Gas Light Company seeks authority to issue 400 shares of new capital stock at $130 per share.

The Brockton Gas Light Company has asked the board's approval of the proposed extension of its main and service in the town of Canton, Mass., where the local authorities have granted the company a franchise to do business.

Chicago Hotel and Restaurant Installations

In many respects the year just closed was one of the most successful years in the history of the Hotel and Restaurant Division of the People's Gas Light & Coke Company of Chicago, Ill.

Notwithstanding the constantly increasing cost of material, as a direct result of the unparalleled conditions across the water, there has been an unusual demand for gas-burning appliances to be used in the wholesale preparation of food.

January and March are the only months that show a loss in sales over the year 1915. We have had an increase in business every other month this year, states the *Advance Club News*, varying from 12 to 97 per cent. The net gain at this time over the corresponding eleven months of last year is 36 per cent.

Some of the important appliances sold last year are as follows:

23 Automatic Water Heaters.
18 Hotel Broilers.
29 Stationary Bakers' Ovens.
23 Sections Chop Suey Ranges.
169 Gasteam Radiators.
146 Sections Hotel Ranges.
7 Reel Bakers' Ovens.
118 Sections Restaurant Ranges.
6 Steam Broilers.
32 Steam Tables.
57 Tank Water Heaters.

The coal displacements for the year have been as follows. Twenty-two coal ranges, ranging in length from 4 to 12 ft., having a total length of 96 ft., and having 21 fires and 28 ovens, two 15-

horsepower steam boilers, two bakers' ovens and three water heaters. These displacements estimated conservatively would amount to approximately 1,200 tons of coal per year.

The estimated annual gas consumption on this year's sales in round numbers is 70,000,000 cu. ft. of manufactured gas and 25,000,000 cu. ft. of industrial fuel gas; total, 95,000,000 cu. ft. This is comparable with 50,000,000 cu. ft. of manufactured gas and 25,000,000 cu. ft. of industrial fuel gas for the year 1915. This is particularly gratifying—first on account of a 20,000,000 cu. ft. increase and also because the increase is all on manufactured gas.

Texas Rates Cut

A cut of 10 per cent. in rates for gas and electricity to consumers in San Antonio, Texas, has been made by the San Antonio Gas & Electric Company according to an announcement made by Vice-President W. B. Tuttle of the company who said the reduction was made possible by a substantial increase in business experienced during 1916. The reduced rates will represent a saving to the people in San Antonio of approximately $100,000.

The gas rate will be $1.12½ per thousand feet, which compares favorably with the lowest price for manufactured gas anywhere in the state. The reduced rates will apply to both large and small consumers.

"The expansion of our gas business, it was explained has been fully as large as in the electrical line. In 1914 there were only 153 miles of gas mains in San Antonio; to-day there are about 200 miles in operation. The work of extending the gas mains was done largely within the last two years. All parts of the city are now supplied with gas, although in order to accomplish this, miles of 'idle' pipe had to be carried through undeveloped sections. This we were willing to do, however, in preparing for business that we are confident will come in after years."

The San Antonio Gas & Electric Company has spent $1,300,000 in the course of the last three years in extending and bettering its service.

Tentative Program for Southern Gas Association Convention Completed

The following tentative program has been prepared for the annual convention of the Southern Gas Association, to be held at Roanoke, Va., May 2 to 4:

MAY 2

8:00 a.m. "Get-to-gether" Breakfast at Rutledge Inn, Mill Mountain, the Roanoke Rotary Club being host. Business meeting at Inn.

10:00 a. m. Bridge Party to the ladies at Hotel Roanoke.

3:00 p. m. Automobile drive around the city.

8:00 p. m. Graduating exercises of the Roanoke Colored Domestic Science School. Music by Hampton Normal School quartette. Also address by Robert Moulton, President Tuskegee Institute, Tuskegee, Alabama.

MAY 3

8:00 a. m. An all day trip to Natural Bridge; dinner at Natural Bridge Inn; business meeting at the Natural Bridge Casino.

8:00 p. m. Dinner given by Rotary Club at Hotel Roanoke.

MAY 4

10:00 a. m. Business meeting at the Auditorium.

10:00 a. m. Card party and luncheon for the ladies at the Country Club.

3:00 p. m. Dancing in the new ball-room at Hotel Roanoke.

8:00 p. m. Convention dinner for gentlemen only.

To all those who play golf a card will be given to the Country Club.

The following list of papers has been prepared:

"RELATIONS EXISTING BETWEEN A PUBLIC SERVICE CORPORATION AND A COMMUNITY," A. B. PATERSON, Meridian, Miss.

"SELLING CAMPAIGNS," GEORGE SLIGO, Atlanta, Ga.

"GAS HEATING," H. D. O'BRIEN, Savannah, Ga.

"PHILOSOPHY OF COSTS," R. L. ELLIS, Selma, Ala.

"DISTRIBUTION SERVICE," F. L. MARSHALL, Augusta, Ga.

"ACCOUNTING," E. C. STOTHART, Charleston, S. C.

"MODERN GAS LIGHTING," H. H. DUNN, Roanoke, Va.

"GAS FOR INDUSTRIAL PURPOSES," L. GASTON, Knoxville, Tenn.

"ADVERTISING," THOMAS R. ELCOCK, JR., Philadelphia, Pa.

Beehive Coke Shipments Show Decrease from Previous Month

The following is a statement of carloads of bituminous coal that originated on 57 railroads in November, 1916, compiled from reports received by the Geological Survey, by noon Dec. 15, 1916. Shipments of beehive coke on 10 roads are also shown.

The decrease in shipments of bituminous coal in November, 1916, of 2.5 per cent., compared with October, 1916, and of 3 per cent., compared with November, 1915, was in part due to the smaller number of working days in November, 1916. The average number of cars of coal per working day was 22,100 in November, 1916, against 20,900 cars in October, 1916, and 21,800 cars in November, 1915.

The shipments of beehive coke in November, 1916, showed a decrease of 7 per cent., compared with October, 1916, and an increase of 2 per cent., compared with November, 1915.

COMPARATIVE FIGURES BASED ON REPORTS FOR NOVEMBER, 1916.

	November, 1916.	*October*, 1916.	*November*, 1915.
Number of working days.....	24	26	25
Carloads of bituminous coal (57 roads)	530,258	544,107	546,426
Carloads of beehive coke (10 roads)..	50,934	54,591	49,828

Supply Proposal Made by West Virginia Company

The Keener Gas Company, operating in Central West Virginia, has a number of industrial gas consumers, but not enough gas to supply them. The Weston Gas Company has plenty of gas but no industrial consumers. In view of the situation, the Weston Company has applied to the public service commission for permission to change its rates so that it may charge a flat rate of 10 cents a thousand cu. ft. of gas, and accommodate the Keener Company's industrial patrons. The Weston Company has a sliding rate ranging from 5½ cents a thousand for all over 1,800,000 cu. ft. to 10 cents a thousand for the first 100,000 cu. ft.

Rates Decrease for Fuel—Increase for Illumination

The state railroad commission after considering the petition of the Americus Public Service Company of Atlanta, Ga., passed an order authorizing increased rates for electric light and power and for illuminating gas, but reduced the price for fuel gas.

The following are the prices authorized:

Electric power, increased from 6 to 7 cents per kilowatt hour; illuminating gas, increased from $1.25 per 1,000 ft. to $1.40; fuel gas decreased from $1.50 per 1,000 ft. to $1.40.

Frederick H. Reed Dead

Frederick H. Reed, vice-president of the J. G. White Company, Inc., electrical engineers, New York City, died Dec. 9, 1916.

Mr. Reed was born in Stamford, Conn., Aug. 22, 1865, and was educated at the Stamford High School, becoming a draftsman and later a surveyor.

He was first construction engineer on the Tenth Avenue cable railway constructed in New York City in 1884 and 1885, and later designed the first commercial electric railway built at Baltimore, Md.

In 1891 Mr. Reed became a member of the firm of Reed & McKibbin, electrical engineers, constructing railways in various sections of the East.

He was elected secretary-treasurer and first vice-president of the J. G. White Company, Inc., in 1891. At the time of his death he was also vice-president and director of the San Juan Light and Transit Company, Porto Rico, and vice-president and director of the Manila Electric Railway & Light Company.

Mr. Reed was a man of strong personality, and a member of many organizations and societies, and his loss is deeply felt in electrical engineering circles.

CHILDREN OF EMPLOYEES OF OMAHA GAS COMPANY RECEIVE GIFTS EACH YEAR

Annual Christmas Entertainment for the Children of the Omaha Gas Company

The Omaha Gas Company's annual Christmas entertainment and tree was held in Washington Hall, Omaha, on Dec. 23 according to the account given by H. A. Johnson of the company. Each year the employees, together with their families, are invited to attend this pleasant event. A few years ago this occasion was held in the commercial office of our company but in the past three years it has been found necessary to rent a large hall in order to accommodate the crowd, which averages about 500 persons, due to the increased number of employees. G. W. Clabaugh, vice-president and secretary, has direct supervision of this entertainment each year. He personally purchases all the gifts for the children, which ranges from toys to books and sleds, given according to the ages of the children. Presents are given to all employees' children who are twelve years old and under. Candies and cigars are also given to the persons who are present at the gathering.

In addition to this entertainment, a list of employees who have been in the company's employment for not less than one year, is published in book form, and their names are arranged in numerical order according to the length of service. Each person's occupation is shown; also the date of employment. A small colored button, showing the employee's number in the book, is also given them at the time. Each year the oldest employee receives gold medal for his faithful service in the company but no person receives more than one such medal. This year this honor fell to L. W. Weymuller, assistant treasurer, who started with the company in 1890, and he was presented with the medal by Mr. Clabaugh who told of the friendly relations between Mr. Weymuller and himself during all these years, and of the faithful and efficient service rendered by the receiver of this valuable token. In response, Mr. Weymuller gave a short outline of the growth our company has made since he entered its circles, stating that in 1890 there were about 3500 meters in service, while at the present time there are nearly 35,000.

Several songs were then rendered and stories told for the children.

Harry Levering, of the Distribution Department, played the part of Santa Claus in a commendable manner and distributed many gifts among some friends he had selected. These gifts brought much pleasure, not only to the receivers but to the others present.

Immense Debt Paid by Gas Company

County Recorder Flannery reports that the Equitable Trust Company of New York has just recently released to the Pacific Gas & Electric Company a $4,000,000 mortgage which covers property in nearly every county in California. The trust was made out to the Pacific Gas & Electric Company December 15, 1907, and was payable as a 36-year trust agreement, that is in December, 1937. The holders, however, evidently found it possible to wipe out the immense debt in a few years, comparatively. The above data is just one more instance of the way money is becoming looser in all parts of the country.

Gas Used by Boston Newspaper for Melting Metal

The Boston American has decided to replace coal with gas as the means of heating its melting pots. At this newspaper plant about 40,000 lb. of type metal is kept molten all the time for stereotyping, reducing linotype and stereotype to pigs and for linotype operation. The Boston Consolidated Gas Company furnishes all the necessary equipment and supplies the gas.

Commission Suggestions

One of the recommendations of a commission appointed in Massachusetts for the investigation of the fuel situation is that gas companies be required to give preference to orders for coke of 100 lb. or less. Another good suggestion that has been made is that the gas and electric light commissioners be given authority to control licenses for selling coal, and to require dealers to sell 25 lb. lots at ton rates.

INTERESTING ENTERTAINMENT HELD BY OMAHA GAS COMPANY

Gas Calorific Tests Being Received by Inspectors at Boston

Data in connection with the tests made by Massachusetts gas companies for calorific values of gas manufactured, are being received by the gas inspector's office and are being tabulated for use in connection with a report which Chief Inspector Jenkins expects to make to the Board of Gas & Electric Light Commissioners about January 10. The results cover a period of six months beginning July 1, 1916, and will be the basis for fixing the standard of heat value for the state.

Personal Notes

M. L. HIBBARD, manager of the Union Light, Heat & Power Company, has been appointed delegate of the Fargo Commercial Club at the annual meeting of the National Chamber of Commerce at Washington, January 31-February 2.

GUY F. HARDEN, superintendent of the Northern States Power Company, Northfield, Minn., has been elected a member of the board of directors of the Northfield Advertising Club.

F. H. MUGG, of the new business department of the Enid Electric & Gas Company, Enid, Okla., addressed the students of Phillips University during the week, on "Natural Gas," referring particularly to its distribution and value for commercial and domestic purposes. He has been asked to address the students again in the near future.

GEORGE THOMAS HART, for more than 50 years in the employ of the Providence Gas Company, died at his home, 567 Angell Street, Providence, R. I., Dec. 24 from a disease of the heart.

F. H. MALONEY, recently of New York City, has located in Arkansas City and is at the head of the commercial department of the Arkansas Valley Gas Company.

H. E. MUSSON, for the past three years telephone, gas and electric expert for the corporation commission, Oklahoma City, Okla., has recently resigned. He has accepted a position with the Smith & Swan Company of Henryetta, operators of several gas and electric plants.

A. E. INGLESH, for the past three years commercial business manager of the Quincy Gas & Electric Heating Company, has tendered his resignation. Mr. Inglesh leaves to accept a responsible position in the office of Mr. Len Small, state treasurer, at Springfield, Ill. W. C. HERLEMANN, head salesman, will attend to the duties of commercial manager until an appointment is made to fill the vacancy.

GEORGE C. HICKS, JR., vice-president and engineer of the P. H. & F. M. Roots Company, of Connersville, Ind., for the past fifteen years, announces his retirement from the company on January 1, 1917. Mr. Hicks will act as consulting engineer for the company for a short time. Before taking up work again, he expects to take a six months' vacation.

Construction Notes

Connections Ordered for St. Paul, Minn.

Commissioner Goss was authorized by the council to order the St. Paul Gas Light Company to install gas connections for all lots along Grand Avenue, between Milton Street and Cretin Avenue, and on Como Avenue, between Rice Street and the Great Northern bridge.

The order is in accordance with the ordinance adopted recently empowering the department of public works to install sewer and water connections and require the installation of gas connections in streets for which the council has ordered paving, these improvements to be made at any time after the adoption of the final order for the paving.

Under the ordinance Commissioner Goss has ordered the water department to install water connections along Grand Avenue, and his department is proceeding with sewer connections on Como Avenue. The officials of the gas light company object to making their connections until service is ordered, but the city officials want the work done before paving is constructed to avoid removal of the surface later.

Contract for Gas Station

The Tracy Brothers Company of Waterbury, Conn., has been awarded the general contract for a gas station and barn to be erected in Stamford, Conn., for the Diamond Oil Company. The station will be 17 & 24 ft., one story high, built of tile and stucco with hot water heat and tar and gravel roof. The barn will be 39 x 58 ft., two stories high, of frame construction. Wilfred E. Griggs of Waterbury is the architect.

Putting Auxiliary Plant in Shape

A force of men have been at work at the artificial gas plant of the Central Indiana Gas Company in South Nebraska Street, Marion, Ind., putting the plant in repair and in readiness to manufacture gas to the full capacity of the plant. Steam was forced into the huge tanks to melt the ice that has accumulated in them, and a supply of raw material has been ordered from which to manufacture the gas.

Although the public service commission had not issued any orders to the company forcing it to do any specific thing to carry out its obligation to gas consumers in the city, the company has given heed to the cry of the shivering consumers, and is preparing to do what it can when the next severe cold spell arrives and saps the heat from the veins of the company.

Iowa Company to Remodel Building

The Iowa Gas & Electric Company has purchased the building in Washington, Ia., adjoining their present offices on the west, now occupied by the post office and formerly owned by Wilber Miller. The plans are already under way for the remodeling of the building for office and display purposes.

New Pipe Line in West Virginia

A franchise has been granted at Charleston, W. Va., by the county court of Kanawha to the Mountain State Gas Company, permitting the construction of a gas and oil pipe line from Dawes on Cabin Creek, and in the center of the oil field of that creek, to Cabin Creek Junction. Work of construction will begin at once. The pipes, according to contract, are to be at least 18 inches under the surface.

Construction in Oklahoma

Among the other Standard Gas & Electric Company's subsidiaries which are enjoying substantial gains is the Oklahoma Gas & Electric Company which reports an increase of 1557 electric customers and 936 gas customers during the year ended December 1, 1916. This company has built transmission lines and gas distributing mains in a considerable amount of new territory during 1916, and contemplates similar construction in 1917. Included in the new gas business of importance, which has been secured by the company recently, is a contract with the Yukon Mill & Grain Company, which will yield an annual revenue of about $15,000. A local distributing system is also being constructed in Yukon and gas is expected to be turned on some time in January.

Financial Notes

THE COLUMBUS GAS & ELECTRIC COMPANY'S gross earnings, and that of its subsidiary properties for October were $712,714, increase $101,407; operating expenses, $367,598, increase $32,988. Surplus was $51,409, gain $60,295. For ten months ended October 31 gross was $7,219,362, increase $718,331, or 11 per cent.; operating expenses $3,592,362, increase $282,486, or 8.5 per cent.; surplus $659,374, increase $416,172.

(*Continued on page* 16, *Advertising Section*)